TECHNOLOGY DEPT

February, 1954

Telephone and Management Engineer

PUBLIC LIBRARY
FEB 24
DETROIT

THE NATIONAL TELEPHONE MAGAZINE

Featuring In This Issue—

★ A Major League Job In Safety, *by E. E. Wyland*
★ Power and Level In Carrier Systems, *by G. D. Wallenstein*
★ Measuring and Scheduling Traffic Work Time, *by Ruth E. Richards*
★ Cable Plant Construction, *by John S. Reed*

TELEPHONE DIRECTORY ADVERTISING EXCLUSIVELY

L. M. BERRY & CO.

Our Policy:

The largest amount of advertising revenue consistent with maintaining the best public relations with subscribers.

General Offices • Hulman Building • Dayton 2, Ohio • Michigan 7421

BRANCH OFFICES in: Birmingham, Alabama • Bristol, Chattanooga, Memphis and Nashville, Tennessee • Harrisburg, Pennsylvania • Jackson, Mississippi • Kansas City, Kansas • Louisville, Kentucky • Milwaukee, Wisconsin • New Orleans, Louisiana • Rochester, New York • Tampa, Florida • Warsaw, Indiana

TELEPHONE DIRECTORY ADVERTISING EXCLUSIVELY

TELEPHONE ENGINEER & MANAGEMENT

The National Telephone Magazine • Vol. 58, No. 2, February, 1954

RAY W. SMITH, Editor
JOHN G. REYNOLDS, Managing Editor
JOHN S. REED, Technical Advisor
VIRGINIA McCOLLUM, Production Manager

ROY F. SMITH, Advertising Director
DON C. SORENSEN, Advertising Manager
ROLAND DAVIES & FRED HENCK, Washington Editors
VIOLET ALTMEYER, Circulation Manager

E. E. GENTRY, MRS. W. L. FAIR, PHIL GLANZER, RICHARD ALLEN, Correspondents

West Coast Advertising Representatives, BRAND & BRAND
1052 W. 6th St., Los Angeles, Calif.

Feature Articles

★ Editorial — "Baby Will Need Shoes" 43
Five million new homes during the next few years will require a lot of telephones—that's why the industry isn't worried about depressions or recessions!

★ Washington Bureau Reports ..... Roland Davies, Fred Henck 47
Administration continues efforts to put federal government on more businesslike basis . . . FCC pro poses filing fee plan . . . REA gives quick answers to questions . . . Hope remains for telephone excise tax reduction.

★ A Major League Job In Safety ..... E. E. Wyland 50
Selling safety requires salesmanship and showmanship.

★ Power and Level In Carrier Systems ..... G. D. Wallenstein 54
Section III of this series deals with yardsticks of speech and carrier transmission, transmission levels, carrier power level, test tone power and constant powers carrier systems.

★ Measuring and Scheduling Traffic Work Time ..... Ruth E. Richards 58
Detailed descriptions and examples provide a basis for translating traffic unit and calls offered into work time.

★ Cable Plant Construction ..... John S. Reed 70
Part II-C of this training course gives details for recording use of spare pairs, making main frame number entries and keeping cross-connecting terminal records.

★ USITA Reports Progress on Advertising Program 76
Independent advertising program receives enthusiastic approval of operating companies, manufacturers and suppliers.

★ Meet Hon. C. L. (Roy) Doherty 90
This is the first of a series of scheduled articles introducing members of state and national regulatory commissions, and officers, directors and chairmen and members of committees of the National Association of Railroad & Utilities Commission.

Feature Departments

★ Across The Editor's Desk 4
★ Telephone Engineer Newsletter 13
★ Telephone Industry Outlook 29
★ Coming Conventions 48
★ Telephone Engineer Handbook Tables 78-79
★ Questions & Answers ..... Jay G. Mitchell 83
★ Court and Commission Activities 92
★ The Back of the Book ..... John G. Reynolds 122
★ Advertisers' Index 121 ★ Professional Services 106 ★ Buyers' Guide 110 ★ Classified Advertising 112

FRONT COVER: On January 22, friends of R. B. STILL, board chairman of the Illinois Telephone Co., Bloomington, honored Mr. Still with a 50th Anniversary Dinner at the Tilden Hotel, Bloomington. Our cover photo shows (l. to r.): BEN RHODES, State Representative; FRANK S. SPRING, pres., Telephone Bond & Share Co., Chicago; Mr. STILL; J. F. VAN de VUSSE, pres., Illinois Telephone Co.; ALLEN S. CRANE, chief executive, Gary Group Operating Companies, Chicago; and RAY J. ALTER, pres., Intra-State Telephone Co., Galesburg, and pres. of the Illinois Telephone Association. The white, gold-dial handset in the center of the speaker's table is Mr. Still's 50th Anniversary telephone.

INDEPENDENT TELEPHONES SERVE 2/3 USArea

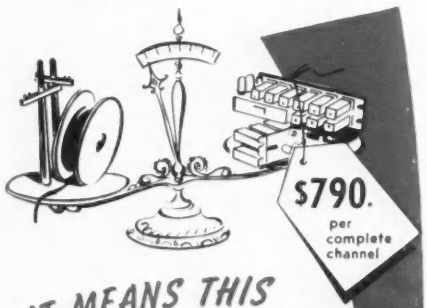
Published Monthly By TELEPHONE ENGINEER PUBLISHING CORP.
7720 Sheridan Road, Chicago 26, Ill.
COPYRIGHT 1954 BY TELEPHONE ENGINEER PUBLISHING CORP

Vol. 58, Number 2. Published monthly by Telephone Engineer Publishing Corp. Office of Publication, Rochelle, Ill. Executive and Editorial Office, 7720 Sheridan Road, Chicago, Ill. Subscriptions: U.S., and Possessions, $3.00 per year; Canada $3.50; in all other countries, $5.50. Single copies, U.S.A., 35 cents. Entered as second class matter at the post office at Rochelle, Ill. under the act of March 3, 1879.

"PROVING-IN" under 5 miles with type 'S' FM Carrier
Subscriber and Trunk

WHAT DOES IT MEAN?

It means that the cost of one complete (installed) channel of McElroy Type 'S' Carrier is less than the true cost of five additional wire miles, based on national averages!



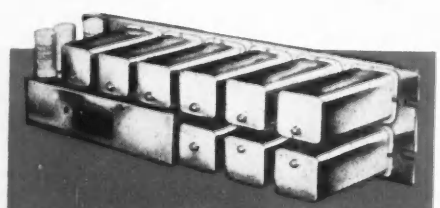
IT MEANS THIS TO YOU!

If the construction costs of providing an additional wire circuit (subscriber or trunk) on your system exceed $790.00, you can "prove-in" with Type 'S' carrier.

AND THAT'S NOT ALL...

Carrier circuits have a very definite maintenance advantage over the years vs. wire circuits.

We urge you to review your expansion requirements and invite your "prove-in" calculations and inquiries.



McELROY
MANUFACTURING CORP.
Littleton, Massachusetts, U.S.A.

Mostly About People—
Across The Editor's Desk

New Arkansas Bulletin

CONGRATULATIONS to the Arkansas Telephone Association on its new association bulletin. Executive Secretary Lois Kehoe sent us a copy of the first issue and we found it packed with good reading. Thanks to Mr. Kehoe for placing our name on the mailing list.

Big Plans For Bridgman

OUR GOOD FRIEND *D. M. Davis*, manager of *Citizens Telephone Co., Inc., Bridgman, Mich.* tells us his company is all set to start a $400,000 expansion and modernization program for the Bridgman exchange. This is in addition to a $280,000.00 expansion and modernization of the New Troy, Mich. exchange owned and operated by the same company which is now being completed and will be converted to dial operation about April 1, 1954.

The Citizens company is owned by Mr. Davis and his family. Mr. Davis is president and manager, *John E. Davis*, an attorney and a disabled veteran of World War II is chairman of the Board, *Ruth C. Davis*, wife of D. M. Davis is secretary, *Pearl A. Davis*, wife of *John E. Davis* is treasurer, and *Wallace M. Davis*, son of D. M. Davis is plant superintendent. These five comprise the board of directors.

President Davis was manager of the Hamilton County Telephone Co., Aurora, Neb., for a period of 20 years and Secretary Ruth C. Davis was formerly an operator and supervisor with the Lincoln (Neb.) Telephone Co.

The Davis family acquired the Citizens company from the late E. E. & Mary Bruner, January 1, 1950. When the company was acquired it was serving about 1200 subscribers with 270 lines. The Davis's have added 76 lines and nearly 500 subscribers. When the dial conversion is completed, the company will have several hundred more subscribers and 1100 lines which will make it possible to offer the service desired.

50th Anniversary Issue

CONGRATULATIONS to J. H. Hartley, editor of LINCOLN TELEPHONE NEWS on the January issue of his publication. Commemorating the 50th Anniversary of the *Lincoln (Neb.) Telephone & Telegraph Co.*, the LINCOLN TELEPHONE NEWS, resplendent in a gold and blue cover, includes the first of a series of historical sketches of Lincoln T&T and its people. This historical series on Lincoln's outstanding Independent company promises to be an important addition to literature describing the telephone's early days.

Nebraska Veterans Honored

A FEW WEEKS ago six men who have been employed for a total of 269 years by the *United Telephone Co. of the West* and its predecessor, the *Platte Valley Telephone Corp.*, were honored at a dinner in Terrytown, Neb.

Honored were *Otto Fuerst*, vice president and general manager, with 56 years; *Earl Weaver*, Scottsbluff equipment maintenance man, 53 years; *Jack Sager*, Oshkosh manager, 45 years; *F. B. Redfield*, Torrington manager, 45 years; *Ernest Frame*, Mitchell manager, 44 years; *Vern Linden*, Scottsbluff wire chief, 26 years.

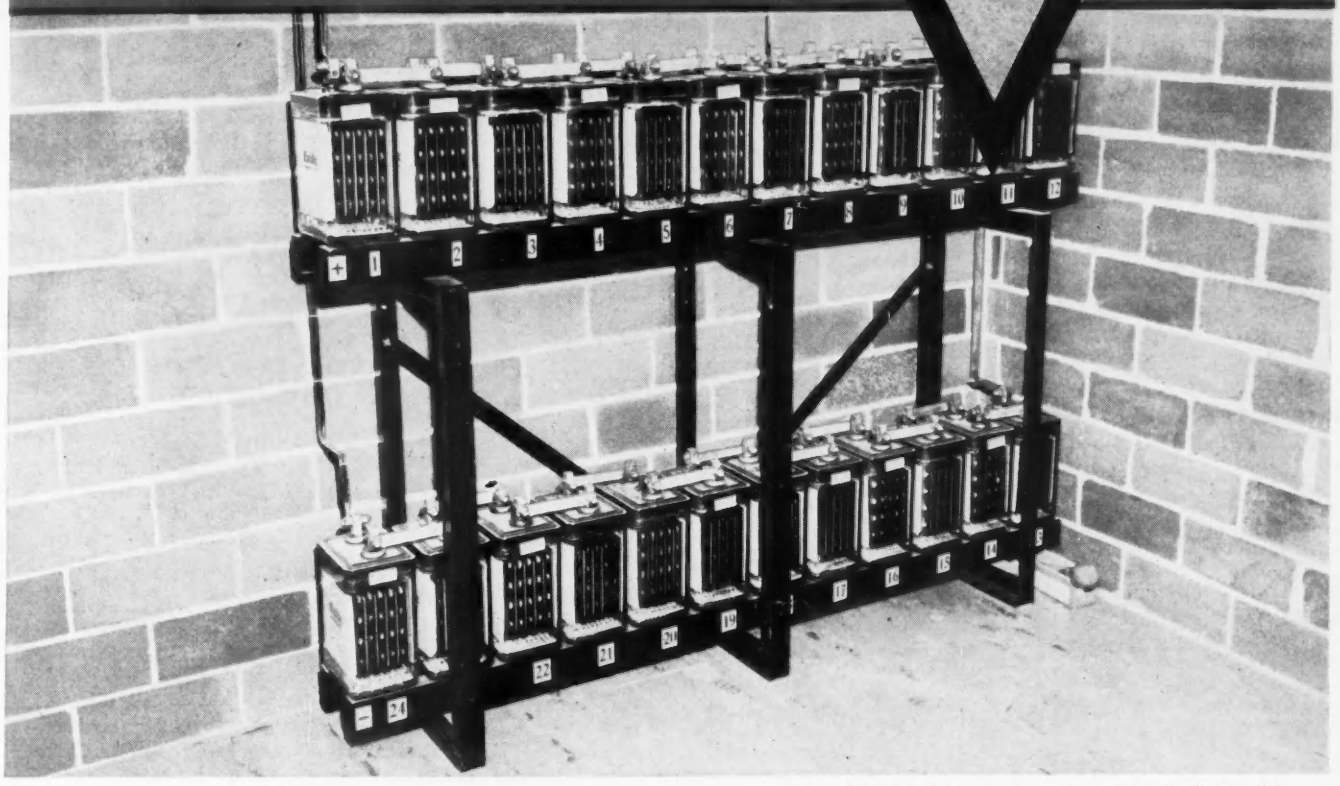
These Nebraska veterans deserve commendation on their long service records and we want to be among the first to say "Congratulations!"

Nebraska's United Telephone can well be proud of its telephone veterans. Possessing six employes with a total of 269 years of service is a record.

DIAL TELEPHONE SERVICE
STARTS HERE . . . WITH

Exide-Manchex
BATTERIES

General Telephone Company's Lyndon Station Exchange, one of several similar dial offices operated by the company in Wisconsin.



24-cell DME-11 Exide-Manchex batteries at the Lyndon Station office.

. . . AT THE LYNDON STATION EXCHANGE OF THE GENERAL TELEPHONE COMPANY of Wisconsin. The Lyndon Station Exchange is a typical community dial office serving part of our country's 50,000,000 telephones. At Twin Lakes, Land O'Lakes, Trevor and other places are similar design exchanges . . . with installations of 100 to 500 lines.

The dial equipment at Lyndon Station is operated by a bank of 24-cell DME-11 Exide-Manchex batteries.

Many telephone companies from coast to coast rely on Exide-Manchex batteries for all telephone applications. Long-lasting Exide-Manchex offers:

POSITIVE OPERATION: Dependable performance for all telephone battery requirements—central office and private exchange equipment.

ADEQUATE RESERVE POWER for emergencies beyond normal needs.

LOW MAINTENANCE COSTS: Water required about twice a year. No change of chemical solution needed during life of battery.

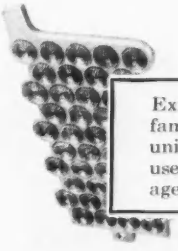
LOW DEPRECIATION: Sturdy, long-life construction which includes the exclusive manchester positive plate.

GREATER CAPACITY in a given amount of space avoids overcrowding of equipment.

• • •

Various sizes and types of Exide Batteries are available in plastic containers.

Exide-Manchex is your best battery buy for all telephone services



Exide-Manchex batteries are different. Their famous Exide manchester positive plates are unique in design and construction, and are used *exclusively* in this outstanding storage battery.

1888 . . . DEPENDABLE BATTERIES FOR 66 YEARS . . . 1954

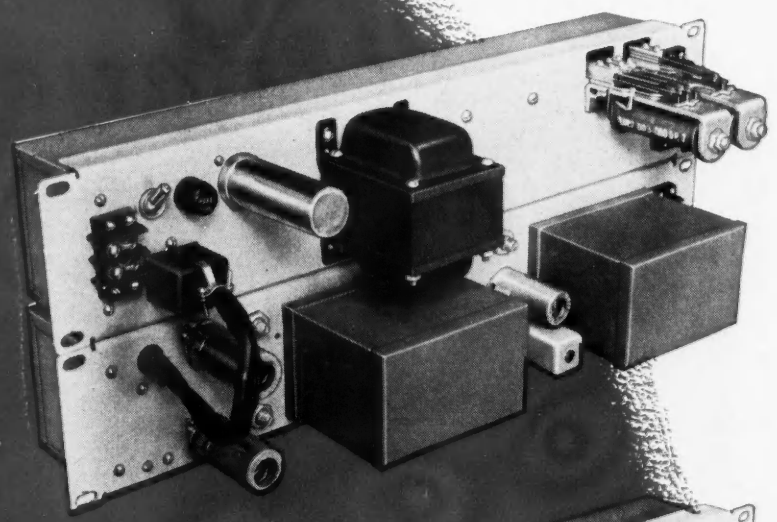
EXIDE INDUSTRIAL DIVISION, The Electric Storage Battery Company, Philadelphia 2 • ***Exide Batteries of Canada, Limited, Toronto***

"EXIDE" and "MANCHEX" *Reg. T.M. U.S. Pat. Off.*

NORTH'S

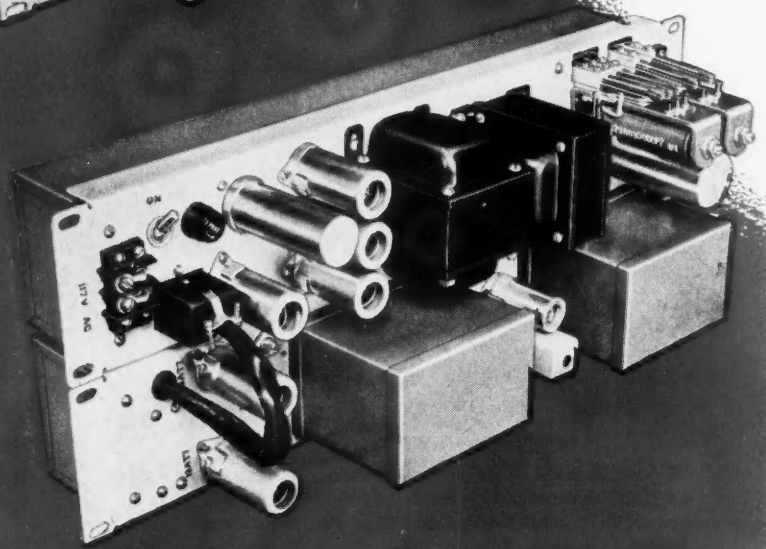
THIS IS

a North RTC single channel exchange termination , the two sections of which occupy only seven inches height in a standard 19" frame. May be installed either on a central office rack or on a pole. It operates on 117-v, 60-cycles. Stand-by power equipment may be supplied, to operate from the central office battery.



THIS IS

a North RTC single channel subscriber termination , usually pole mounted where it is to serve several party line subscribers, and where a 117 volt 60 cycle power source is available. May be mounted in a subscriber's garage or basement. Stand-by power may be provided if desired.



ALL YOU NEED

for a complete installation of a channel of North RTC is the simple compact equipment shown above, with power connections, protectors and such bridging filters or transfer sets as may be required.

Ask for "Bulletin C 541"

*System shown is stackable to three channels. Fourth and fifth channels may be added when available.

NORTH

NEWEST!

Rural Telephone Carrier

Brings you more subscribers

Without new line construction

Modern telephone carrier, with which several subscribers can be added to an existing metallic line (single pair) without disturbing those using the physical circuit, is now a practical application for rural telephone systems.

The new North Rural Telephone Carrier, the first available at its low price, is so economical to install that it will pay you to substitute carrier for new open wire construction on any line from 3 ¼ miles upward. It is a stackable system . . . up to three channels.*

With North RTC you can provide line service for subscribers along a now loaded metallic loop . . . you can accomodate those waiting for service where additional line construction would otherwise be required . . . where party line service is desirable, you can add as many as ten subscribers to an existing metallic line with each low-cost stackable channel of RTC applied.

North RTC is the first to provide carrier equipment so simple that you can start with a modest installation of one to three channels and add as gradually or rapidly as required. The compact units which make up exchange and subscriber terminations are shown at left. They are easy to install on any line now providing commercial quality physical circuits. Service requirements on such lines are minimum. Opertaing costs are low.

Wherever unusual conditions exist in a system which would prevent efficient carrier operation, North engineers provide free consultation on simple corrective measures.

Ask a NORTH man to check your system for possible application of Rural Telephone Carrier

THE NORTH ELECTRIC MANUFACTURING COMPANY

655 South Market Street • Galion, Ohio

TRUE TO A BRILLIANT TRADITION . . .

KELLOGG proudly presents an outstanding new telephone . . . fully worthy of the name that has remained an unquestioned symbol of progress for more than half a century . . .

A new standard of excellence...

for the independent telephone industry

It Enhances a 57-Year-Old Reputation for Consistent Leadership in the Independent Telephone Field . . .

It Brings You Distinctly New Superiority for a Future of Outstanding Service . . .

• Manufacture and sale of the Kellogg K-500 Telephone is made possible by a patent license agreement between Western Electric Company, Incorporated, and International Telephone and Telegraph Corporation.

KELLOGG K-500 TELEPHONE

SPEAKS BEST FOR ITSELF

KELLOGG proudly presents the K-500 Telephone . . . a triumph of modern engineering . . . far surpassing all previous performance standards!

The unchallenged superiority of the K-500, stemming from the ingenious simplicity of its design, offers positive advantages of vital importance to Independent Telephone Companies. In terms of quality, dependability and economy, its peerless performance characteristics will bring you an altogether new degree of service . . . *completely exceeding anything you have ever known!*

Introducing superior telephones is not new to Kellogg . . . The first handset telephone in the United States . . . the first unit type telephone with all components in single housing and base assembly . . . the famous universal-design 1000 Series Masterphone for all classes of service—all were outstanding developments of Kellogg's productive past. And Kellogg leadership is proved again with the presentation of the K-500 . . . the new standard of excellence in the Independent Telephone Field!

KELLOGG # K-500 **TELEPHONE**

brings you these superior features!

- New High in Transmission on Longer Loops
- Improved Dialing Performance
- Automatic Controls Give Uniform Performance on Short Loops
- New Shorter Handset Provides Extended Frequency Bandwidth and Improved Performance
- Increased Transmitting and Receiving Efficiency
- New Line of Biased and Frequency Selective Ringers
- Reinforced Resonator for Lower Tone Ringing Quality
- Ringer Performance and Loudness Controls

WRITE FOR COMPLETE TECHNICAL DATA TODAY!

KELLOGG BRANCH WAREHOUSES AND OFFICES:

6000 W. 51st Street
CHICAGO 38, ILLINOIS
REliance 5-5445

4501 Truman Road
KANSAS CITY 1, MISSOURI
HUmboldt 7085

410 N. Syndicate Avenue
"Midway Area"
ST. PAUL, MINNESOTA
Nestor 5878

1515 Turtle Creek Blvd.
DALLAS 2, TEXAS
Prospect 6207

1663 Mission Street
SAN FRANCISCO 3, CALIFORNIA
Market 1-6011

1555 West Fourth Street
MANSFIELD, OHIO
Mansfield 7146-6

157 Chambers St.
NEW YORK 7, NEW YORK
BEekman 3-8505

KELLOGG BRANCH OFFICES:

406 S. Main Street
LOS ANGELES 13, CALIFORNIA

720 S. Washington Street
PORTLAND 5, OREGON

your nearby **KELLOGG** warehouse is ready to take your K-500 order now

KELLOGG DIVISION OF IT&T

KELLOGG SWITCHBOARD AND SUPPLY COMPANY
A Division of International Telephone and Telegraph Corporation
Sales Offices: 79 West Monroe Street, Chicago 3, Illinois—Dearborn 2-0750

Printed in U. S. A.

NEWSLETTER
TELEPHONE ENGINEER

Fortnightly TELEPHONE ENGINEER ★ TELEPHONE ENGINEER AND *Management*

ON THE 1st OF EACH MONTH ON THE 15th OF EACH MONTH

February 15, 1954

Dear Sir:-

SEC REVAMPS RULES ON PROXY STATEMENTS: – With minor revisions, Securities & Exchange Commission (SEC) Jan. 6 made final proposed rules aimed at eliminating requirement that managements include in their proxy statements stockholder-proposed resolutions which have obtained negligible shareholder support in the past.

With new rules, effective with proxy solicitations begun on or after Feb. 6, "a proposal may be omitted for a period of 3 years from the last previous submission if it was submitted within the previous 5 years & received less than 3% in the case of a single submission, less than 6% upon a second submission, or less than 10% upon a third or subsequent submission during such 5- year period," SEC said.

REA REPORTS ON TELEPHONE LOANS: – Advances of farm telephone loan funds by Rural Electrification Administration (REA) last year nearly doubled, from $15,000,000 in 1952 to $26,000,000 in 1953, REA Administrator Ancher Nelson reported Jan. 8. During year, 30,000 rural subscribers in 126 exchanges were covered by REA telephone projects. 45 modernized REA-financed systems were put into service, twice as many as were completed during first 3 years of the program. Systems went into operation in Alabama, Florida, Kentucky, Michigan, New Jersey, North Dakota, Oklahoma, Utah, & Wisconsin during the year, Mr. Nelsen recalled.

GENERAL TEL. HAS RISE IN CONSOLIDATED NET: – For first 11 months of 1953, General Tel. Corp. & subsidiaries had consolidated net income of $12,375,000, compared with $7,699,000 in same period of 1952, company reported last month. After dividends on preferred stock, earnings per average share during period were $4.05, against $3.32 in first 11 months of preceding year.

FCC PROPOSES RULE ON ANNUAL REPORTS: – A proposed rule looking toward rescinding of 2 statistical circulars, so that certain small communications companies will no longer have to file annual reports with FCC, was announced Dec. 30 by Commission. Commission proposes to solicit any essential information by mail from 37 companies involved. Rule changes affect common carriers having annual operating revenues of not more than $50,000, & class C telephone companies with annual revenues of between $50,000 & $100,000.

RECENT CHANGES IN OWNERSHIP: - East Otter Tail (Minn.) Tel. Co. purchased telephone properties of New York Mills (Minn.) Tel. Co. . . Winnebago Co-op Tel. Assoc. authorized to purchase properties of Farmers Tel. Co., Emmons, Minn. . . Rural Tel. Co., Norton, Kans., purchased Logan (Kans.) Tel. Co. Rural Tel. Co. Pres. Leland Archer said REA-financed company will provide service in six counties . . . Vergas (Minn.) Tel. Co. purchased Candor (Minn.) Tel. Co.

Please Turn To Page 20

KELLOGG

Your nearest Kellogg shipping point is never far away — KELLOGG'S six conveniently located warehouses and more than 100 supplier distribution points throughout the country assure you fast, economical delivery of guaranteed line supplies.

Your Nearest Kellogg Shipping Point Is Never Far Away!

KELLOGG DIVISION OF IT&T

KELLOGG SWITCHBOARD AND SUPPLY COMPANY
Sales Offices: 79 W. Monroe St., Chicago 3, Ill.
A Division of International Telephone and Telegraph Corporation

Send Your Next Order for Supplies To:

BRANCH WAREHOUSES AND OFFICES:

6000 W. 51st Street
Chicago 38, Illinois

410 N. Syndicate Avenue
"Midway Area"
St. Paul, Minnesota

1663 Mission Street
San Francisco 3, California

4501 Truman Road
Kansas City 1, Missouri

1515 Turtle Creek Blvd.
Dallas 2, Texas

1555 West Fourth Street
Mansfield, Ohio

BRANCH OFFICES:

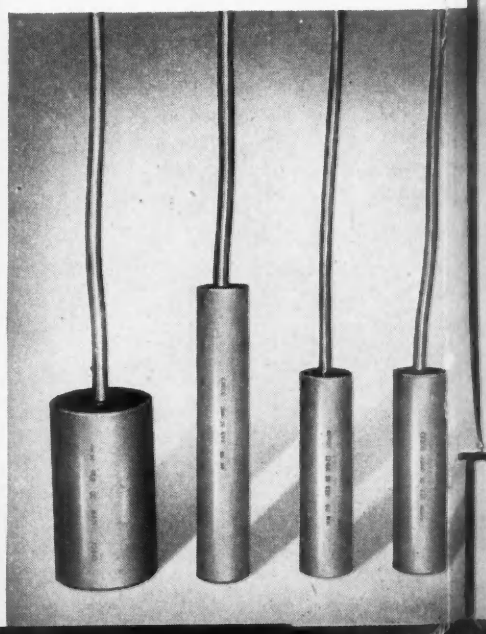
406 S. Main Street
Los Angeles 13, Calif.

720 S. W. Washington Street
Portland 5, Oregon

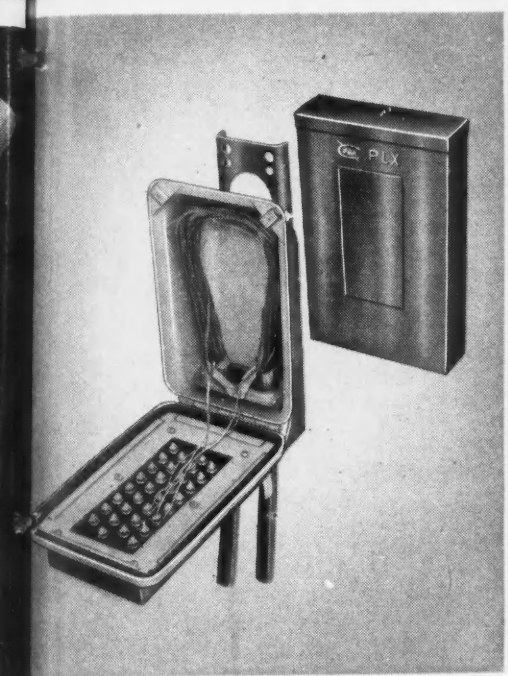
Standard in the Industry! Wiebel's Insulator Pins made of A-1 Grade, hard, close-grained Locust Wood is your guarantee against moisture penetration and decay. No shrinkage or warping. Adequate stocks in all Kellogg warehouses. L. H. WIEBEL, INC.

•

Application of Loading Coils on telephone circuits, reduces unit loss to 1/3 or 1/4 the non-loaded value—coils shown are used on 2-wire telephone circuits in non-quadded paper insulated or plastic cable. COMMUNICATION EQUIPMENT ENGINEERING CO.



HEADQUARTERS FOR SUPPLIES



For Plastic Covered Cable —the Cook P-L-X Cable Terminal is simple to install — designed for maintenance free operation. No stubbing, no splicing, no potting makes it cimples and more economical. COOK ELECTRIC COMPANY.

•

Cable Lashing Wire for use with modern Cable Spinners, Crapo Galvanized ("C" Coated) Lashing Wire available in .091" and .061" diameters. Wire also available in .045" and .065" diameters. Made by INDIANA STEEL & WIRE CO.

These Double-Faced Signs are made of long-life porcelain enamel fused to heavy gauge steel. Clear visibility and permanent colors are features of signs made by INGRAM-RICHARDSON MANUFACTURING CO. With either plain or activated surface.

•

Anchoring Devices for Fastening to Masonry! Star Dryvin—an expansion device quickly hammered into place. Single or double head nail. Star Springin—spring-wing toggle bolt used in hollow walls and ceilings. STAR EXPANSION BOLT COMPANY.

Lasts 40% Longer . . . requires 80% less current and water . . . delivers high output throughout its life. C&D's PlastiCal, a basically new battery, combines a durable, clear-plastic case with strong lead-calcium grids. Made by C&D BATTERIES, INC.

•

Reliable-Economical! "Eveready" "Columbia" "Gray Label" telephone dry cells give you dependability, plus economy thru higher sustained voltage and extra service life. NATIONAL CARBON COMPANY, a Division of Union Carbide and Carbon Corp.

WILL *your* NEW CARRIER CONVERT TO TOLL DIALING ECONOMICALLY?

Lenkurt Carrier *will*—much easier, quicker, and at far lower cost than any other carrier!

What does this mean to *you?* Protection for your carrier investment when you convert your small exchanges from manual to unattended automatic operation, and when you adapt to nationwide toll dialing! You can use Lenkurt Carrier now to provide toll circuits on a ringdown basis; then when you convert to automatic operation, you can easily and quickly convert these circuits to provide dial trunks.

How do you convert Lenkurt Carrier from ringdown to dialing? By merely changing two simple plug-in-relays! There's no bother with expensive conversion kits, adapters, replacement of panels, no extensive rearrangements. You convert in a matter of *minutes!*

Remember, too: there's no need to build additional costly copper toll circuits when you can provide extra channels more economically with carrier. Follow the lead of dollar-wise telephone men and look into the many advantages you get only with Lenkurt Carrier.
Write today. Our engineers will be glad to help you.

Manufactured for

AUTOMATIC ELECTRIC

Originators and Developers of the Strowger Step-by-Step "Director" for Register-Sender-Translator Operation . . . Machine Switching Automatic Dial Systems

Makers of Telephone, Signaling and Communication Apparatus • Electrical Engineers, Designers and Consultants

Distributors in U. S. and Possessions: AUTOMATIC ELECTRIC SALES CORPORATION
Export Distributors: International Automatic Electric Corporation
1033 West Van Buren Street, Chicago 7, U. S. A.

SEE HOW THIS
WORKSHOP ON WHEELS
SAVES TRIPS
SAVES MONEY

6 models with Service-Utility bodies. 77-inch body lengths for 115-inch wheelbase models, 89-inch lengths for 127-inch wheelbase models. GVW ratings, 4,200 to 6,500 lbs.

Here is one of the best ideas for reducing expenses that ever hit the service-trade and public utility fields ... INTERNATIONAL Trucks with Service-Utility bodies.

You save, first, with these advanced, efficient trucks because they speed up work. They have big capacity, locking compartments that provide space for tools, parts, and equipment, with built-in trays, shelves, and bins for orderly, convenient storage.

You save, second, because they take the workshop right to the job. Workmen have everything they need—right with them—on every service call. Vise brackets, pipe supports and ladder racks are available as optional equipment. With Service-Utility bodies you reduce mileage and wage costs caused by job-to-shop trips for needed items.

You save, third, because INTERNATIONAL engineering and design—the same as that which has made INTERNATIONAL the heavy-duty sales leader for 22 straight years—gives you long truck life, lowest operating and maintenance costs.

It will pay you to check into the many advantages afforded by INTERNATIONAL Trucks with Service-Utility bodies. Time payments arranged. Get full details from your INTERNATIONAL Dealer or Branch.

INTERNATIONAL HARVESTER COMPANY • CHICAGO

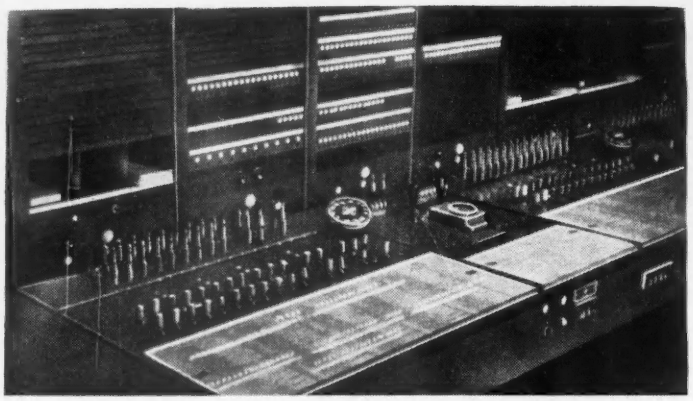
International Harvester Builds **McCORMICK®** Farm Equipment and **FARMALL®** Tractors ... Motor Trucks ... Industrial Power ... Refrigerators and Freezers.

→ Get the News! Alex Dreier "Man on the Go," daily NBC Radio, sponsored by INTERNATIONAL Truck Dealers.

INTERNATIONAL® TRUCKS
"Standard of the Highway"

CALCULAGRAPH ACCURACY!

...works for you in important cost-saving ways



Photos courtesy of Automatic Electric

MODEL 33
FOR SWITCHBOARD
MOUNTING - OTHER
MODELS TO MEET EVERY
INSTALLATION NEED

AUTOMATICALLY FIGURES TOLL TIME! With Calculagraph on the job, there is no need for time-consuming, service-slowing manual figuring of elapsed time. Calculagraph does it all quicker, easier and, most important, with complete accuracy.

ACCURATE TO THE SECOND! Calculations are accurate down to the last second. Authoritative and indisputable, they make it possible to collect all the revenue due on every toll call — a basic advantage in exchanges large or small.

PERMANENT PRINTED RECORDS! Calculagraph prints elapsed time on permanent toll tickets which make accounting methods simpler, more efficient. Toll tickets are easy to read, remain legible permanently and are available for reference at any time.

COMPLETE INFORMATION ON AUTOMATIC TOLL TIME CALCULATING AND RECORDING IS CONTAINED IN THE CALCULAGRAPH FILE CATALOGS . . . WRITE TODAY.

THE STANDARD OF ACCURACY SINCE 1892

CALCULAGRAPH COMPANY
HARRISON • NEW JERSEY

Please send copy of the new catalogs on automatic toll time calculating and recording.

NAME_____ TITLE_____

COMPANY_____

STREET_____

CITY_____ ZONE_____ STATE_____

EWING GALLOWAY

Recognized Everywhere...

WHEREVER YOU LIVE, you recognize this view of Chicago, a great city, famed for its beautiful lake shore. And the Chicago area recognizes the Leece-Neville Alternator . . . it is doing a great job there every day on cars and trucks of several utilities.

This is just one of the many places where you will find L-N Alternators. They're in Allentown, Amarillo, Portland, Montreal and hundreds of other city and rural utilities, large and small, here and abroad.

More than eight years of reliable performance on thousands of cars and trucks has earned this wide acceptance of the L-N Alternator as a replacement for the conventional d. c. generator.

Because the L-N Alternator delivers 25 to 40 amperes at curb idle, batteries stay charged, vehicles keep rolling, crews stay on the job. L-N Alternators have ample capacity to handle a big load of accessories . . . up to 95 amperes on 6 volt systems; to 180 amperes for 12 volt. With the L-N Alternator System, two-way radio is surer and clearer. And radio maintenance costs are much lower.

By attaching an L-N Transformer to the Alternator, 110 volt power is available. Your crews can plug in soldering irons, flood lights, electric drills and other portable power tools. Send for special Transformer folder.

You can rely on L-N Alternators to go on delivering top performance year after year with only routine maintenance. Many L-N Alternators have run 500,000 miles and more.

Be sure to specify L-N Alternators on your vehicles. For all the facts, write The Leece-Neville Company, Cleveland 14, Ohio.

Custom-Engineered Electrical Equipment Since 1909

you can rely on **Leece-Neville** Alternators

proved by performance for over 8 years

NEWSLETTER
TELEPHONE ENGINEER

(Continued From Page 13)

RECENT INCORPORATIONS: – Mona Short Line Tel. Co., Sundance, Wyo., filed incorporation papers. Company is capitalized at $100,000. Directors are M. O. & Dorothea Trego, & Jay Durfee, all of Sundance . . . Dove Valley Tel. Co., Angora, Neb., filed notice of incorporation. Resident agent is W. V. Dove . . . Prairie Tel. Co., Pisek, N. D., filed articles of incorporation. Trustees are Ralph Soblick, J. A. Zikmund, & J. L. Kouba, all of Pisek.

RURAL CO-OP ACTIVITIES: – REA has approved sales agreement enabling Twin Lakes Tel. Co-op. to purchase telephone properties operated by Southern Continental Tel. Co. in Overton, Clay, Pickett & Fentress Counties, Tenn. . . Barnesville (Minn.) Rural Tel. Co-op. has purchased Abercrombie (N. D.) Tel. Co. from C. M. Sorum, & Mooreton (N. D.) Tel Co. from Mrs. Helen Rodavich . . . West Kentucky Rural Tel. Co. asked Kentucky Public Service Commission approval of plan to purchase telephone properties at Hazel, Sedalia, Wingo, Lowes, Fancy Farm & Cunningham.

MEXICAN TEL. CO. CONSIDERS METERED SERVICE: – Mexican Tel. Co. has announced that consideration is being given to establishment of metered telephone service as means of improving financial position of company, which reportedly is having considerable difficulty attracting new capital for badly needed expansion & improvement of service. Company installed 15,000 new telephones during 1953 & replaced 6500 more units in Mexico City, Mexican Ministry of Communications & Public Works announced.

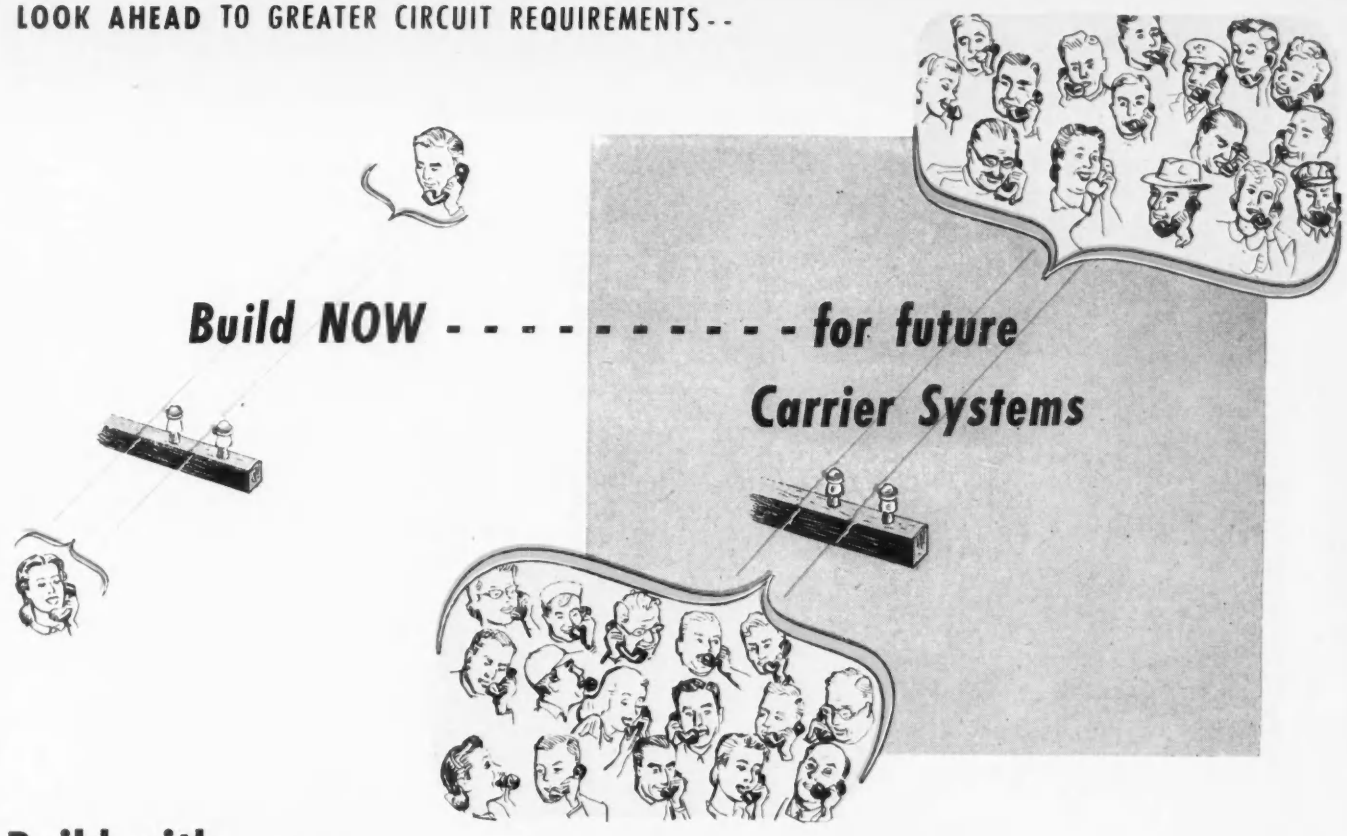
HELPFUL LITERATURE: – Bulletin S. E. P. 10-52, available from Katolight Corp., 624 N. Front St., Mankato, Minn., describes new Kato JKW, AC generator . . . "Power Points Digest" Vol. X, No. 1, available from D. W. Onan & Sons, Inc., Minneapolis, Minn., describes company's Model "CW" electric generating plant.

PEOPLE IN THE NEWS: – William E. Manning appointed mgr. General Tel. Co. of Mich., Escanaba. He suceeds Hugh Kennedy who transfers to Muskegon . . . Gerald D. Miller appointed mgr. Camden (Mich.) Rural Tel. Co. . . . Ellis J. Waller, pres. of Boss Mfg. Co., Kewanee, Ill., elected to board of directors of General Tel. Co. of Illinois, Springfield . . . Joseph Escheer, Federal Councilor of Switzerland in charge Swiss Post Office & Communications Dept., has been elected vice pres. of Switzerland. Vice Pres. Escheer will continue to head postal & Communications dept. Director General of department is Dr. Edward Webber . . . A. Theron Baldwin appointed personnel director of General Tel. System, New York City . . . Arthur Muller has been elected pres. of the Yorktown (Ia.) Tel. Co. . . . Stanley James has been elected pres. of Stanley (Ia.) Cooperative Tel. Co.

IKE'S BUDGET PROPOSES $75,000,000 FOR REA:–President Eisenhower's recent budget message asked for new loan authority of $75,000,000 for Rural Electrification Administration's farm telephone program. This compared with current fiscal year's $67,500,000 in new authority, &

Please Turn To Page 24

LOOK AHEAD TO GREATER CIRCUIT REQUIREMENTS - -



Build NOW - - - - - - - - - - - for future Carrier Systems

Build with Copperweld® LINE WIRE

Here's another important reason why far-sighted communication men are stringing dependable Copperweld* Line Wire today. It's in anticipation of carrier current systems to come. Then, with Copperweld already on the job, there will be no expensive and troublesome line wire replacements needed when increased traffic dictates conversion to this multi-circuit type of telephone service.

Copperweld Line Wire has better voice and high frequency transmission characteristics than any other high-strength conductor. In fact, at carrier frequencies the conductance of Copperweld is comparable to solid copper, due to "skin effect." This important advantage makes Copperweld the only high-strength line wire suitable for carrier circuits.

The copper-protected steel core of Copperweld provides permanent strength and mechanical stability—assures safer long spans with substantial savings in initial construction and annual upkeep.

Want complete technical data on non-rusting Copperweld Line Wire? Write us today—there's no obligation.

*Trade Mark

COPPERWELD STEEL COMPANY Glassport, Pa.
SALES OFFICES IN PRINCIPAL CITIES

Copperweld Line Wire

STRONG, NON-RUSTING

THE ONLY HIGH-STRENGTH CONDUCTOR SUITABLE FOR CARRIER CURRENT SYSTEMS

SOLD BY LEADING DISTRIBUTORS

SPRING

The National Telephone Magazine

TELEPHONE ENGINEER and MANAGEMEHT

APRIL, 1954 VOL 58, NUMBER 5

to telephone men-

SPRING SIGNALS

TWO IMPORTANT TASKS!

a. It's time to repair or replace equipment damaged by the ravages of old man winter.

b. It's time to get started on planned CONSTRUCTION projects.

The SPRING CONSTRUCTION ISSUE OF TELEPHONE ENGINEER and MANAGEMENT, April 15

can be of material aid to you and your men on both of these jobs.

If you are not receiving Telephone Engineer and Management regularly or would like to subscribe to it for your outside plant men — use the following subscription order blank.

Partial Editorial Index of the SPRING CONSTRUCTION ISSUE *of Telephone Engineer & Management, April* 15

(1) "TELEPHONE USES OF POWER DRIVEN TOOLS," *by John S. Reed.*

This timely article will discuss and illustrate portable diggers, chain saws, power drills, masonry drills, torque type tools, portable generators for operating the tools, and other power driven equipment that has proved adaptable for telephone work.

(2) "NEW IDEAS FOR BETTER JOB PERFORMANCE," *by Myrle Shafer.*

This article will present many job performance ideas that have proved-in in normal day-to-day telephone operations and during emergencies. In this article, the reader will find ideas that will play an important part in holding costs down.

(3) "NEW MATERIALS & EQUIPMENT," *by Richard Allen.*

Among the new items to be discussed in this timely article are: (1) a new guy protector; (2) an improved ventilation and air conditioning filter; (3) a new type of compression sleeve; (4) a device for moving spools of wire; and (5) a retractible wheel clock.

(4) "USE OF MICROWAVE IN COMMNICATIONS," *by John G. Reynolds.*

Microwave is America's fastest growing communications medium and industry leaders predict that continued industry growth and the need for additional circuits will result in wide use of microwave equipment. This article will thoroughly cover microwave in outside plant applications.

(5) PLUS THESE FEATURES:

* Modern Cable Plant Construction
* How-To-Do-It Suggestions
* Telephone Engineers' Handbook Tables
* "Questions and Answers"
* Traffic Management Methods
* Washington Bureau Reports
* Telephone Industry Outlook
* Telephone Engineer Newsletter
* Court and Commission Activities
* Industry News Briefs

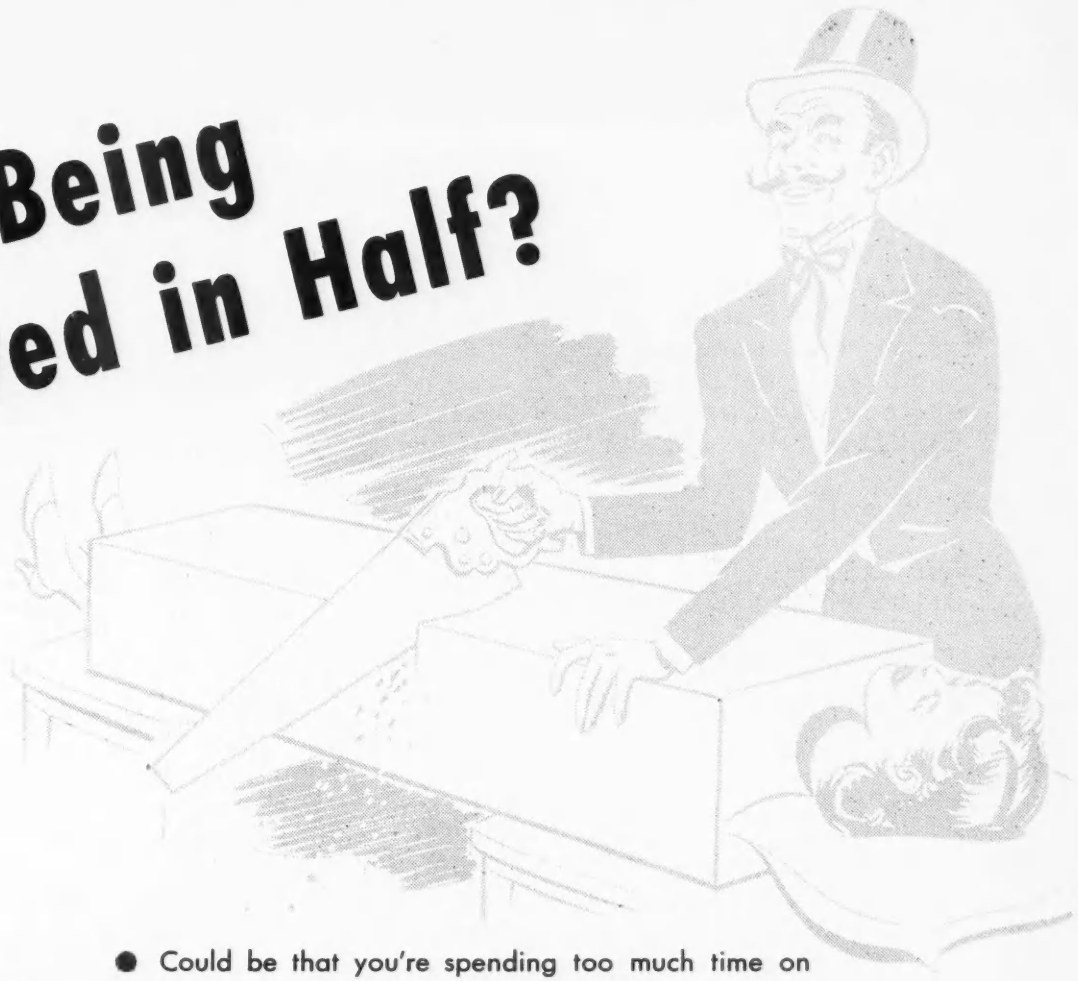
TELEPHONE ENGINEER & MANAGEMENT
7720 Sheridan Road
Chicago 26, Illinois Date

Please enter a one year subscription to TELEPHONE ENGINEER & MANAGEMENT for the following. I am enclosing $3.00 to cover or will send payment upon receipt of statement to cover.

Name, Please Print Title or type of work

Company Address City, Town and State

Are You Being Sawed in Half?



● Could be that you're spending too much time on directory advertising and still are not getting profitable results. It's impossible to be half-manager, half-advertising man. Estimate the hours that you spend on advertising details. Couldn't this time be spent more wisely elsewhere in your management job? Why not let a Loomis representative show the increased revenue – with public relations dividends – of the complete Loomis directory advertising service.

KNOW-HOW TO SOLVE YOUR DIRECTORY PROBLEMS

"Where to Call"

● 666 cities and towns in 20 states are served by the 234 directories that retain Loomis services.

LOOMIS
ADVERTISING COMPANY

FT. WAYNE, IND.
229 E. Berry St.... EAstbrook 3477

ST. LOUIS, MO.
506 Olive... GArfield 3700

OMAHA, NEBR.
Omaha Nat'l Bank Bldg.... ATlantic 0188

KANSAS CITY, MO.
810 Baltimore... HArrison 1270

PHILADELPHIA, PA.
1201 Chestnut... Rittenhouse 6-4400

BALTIMORE, MD.
1229 North Charles... Vernon 7-0642

(Concluded From Page 20)

estimate of $74,000,000 in actual loans during present fiscal year. It was estimated that by end of fiscal 1955, a total of $267,000,000 will have been lent in REA program. Administrative funds of REA will continue to show trend of recent years, in declining in electrification field & rising for telephone work, if budget recommendations are accepted by Congress. Telephone administrative funds would be $3,013,000 in fiscal 1955, compared with $2,956,000 in 1954.

RURAL CO-OP ACTIVITIES:-Griswold (Ia.) Co-op Tel. Co. completed cut-over to dial operation. New system which was financed by $295,000 REA line was dedicated Feb. 1 . . . E. D. Hildreth, mgr. of De Kalb Tel. Co-op announced completion of new dial system at Alexandria, Texas.

NEWS HIGHLIGHTS: - Jasper-Steuben Tel. Corp., Alfred, N. Y., granted charter of incorporation listing capital stock of $100,000. Directors are: W. Bradford Dryden; O. W. Heime, Syracuse; W. B. Harrison, Alfred . . . Greenleaf (Kans.) Tel. Co., Inc., completed incorporation procedure. Authorized capitalization is $20,000. E. W. Holden named resident agent . . . Ross Gault, Wellsville, Kans., pres. of W.E.G. Dial Tel., Inc., Gardner, announced completion of conversion project that brought dial service to 1400 farm families in area between Olathe & Ottawa, Kans.

J. L. Costin, mgr., Crown Point (Ind.) Tel. Co., Inc., filed notice of intention to dissolve company . . . H. E. Vaupel, mgr., General Tel. Co. of Calif., Hermosa, announced $425,000 building construction program. Building will house new equipment . . . George B. Amas, Coeur d'Alene, div'n. mgr. of General Tel. Co. of N.W. announced St. Maries will be converted to dial in summer of '54 . . . Robert A. Dowling, pres. of Pattersonville (N. Y.) Tel. Co. announced proceeds of $45,-000 preferred stock issue will be used to provide funds for new equipment . . . Homer Christenson, pres. of Ranier (Wash.) Tel. Co., reports completion of $30,000 dial conversion project at Ranier. Company has grown from 84 to 200 subscribers in less than 7 years.

Mrs. Lucille Clinkenbeard, sec. of East Okanogan Farmers Tel. Co., Molson, Wash., reports company may sell its properties to North Central Washington Rural Tel. Exchange . . . Manfred Farm Tel. Co. granted permission to discontinue its Manfred, N. D., exchange. N. W. Bell has agreed to serve town's 100 subscribers . . . Georgia Continental Tel. Co. converted its Fort Gaines, Ga., exchange to dial operation Dec. 29. Vice Pres. J. H. Wright says company plans conversion of 4 remaining magneto exchanges & inauguration of one additional new exchange in '54.

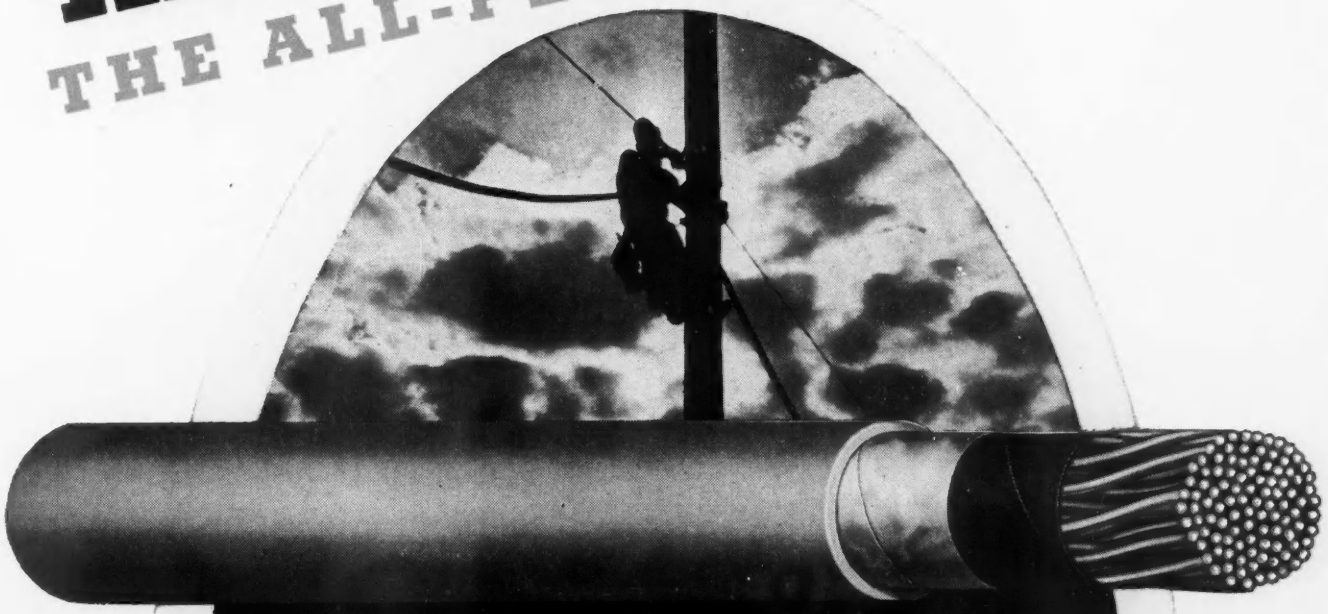
Ray Smith

Ray W. Smith, Editor

· ANSONIA ·

Ankoseal®

THE ALL-PLASTIC CABLE



LIGHTER WEIGHT

Ankoseal's lighter weight reduces the number of men, hours of labor, and materials required for installation. Use it on your next job.

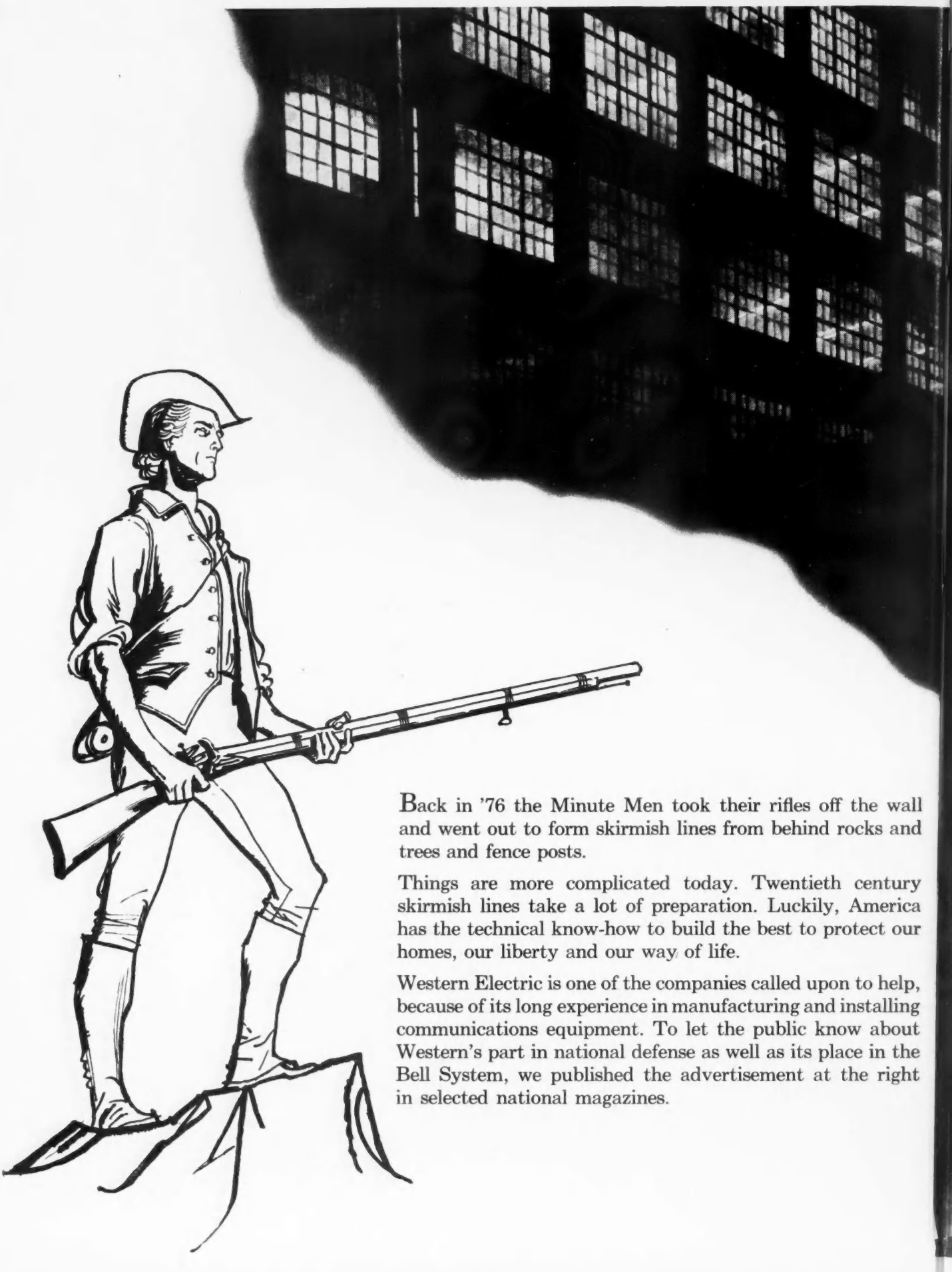
Ankoseal also is —

ELECTRICALLY SUPERIOR
WATERPROOF
CHEMICAL RESISTANT
WEATHERPROOF

THE ANSONIA
WIRE & CABLE COMPANY

SUCCESSOR TO THE ANSONIA ELECTRICAL COMPANY

ANSONIA, CONNECTICUT • PHONE: ANSONIA 4-3306



Back in '76 the Minute Men took their rifles off the wall and went out to form skirmish lines from behind rocks and trees and fence posts.

Things are more complicated today. Twentieth century skirmish lines take a lot of preparation. Luckily, America has the technical know-how to build the best to protect our homes, our liberty and our way of life.

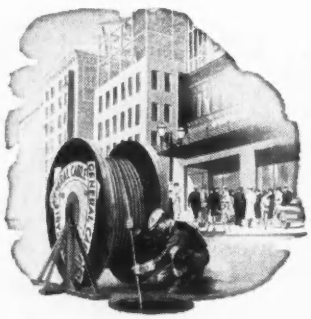
Western Electric is one of the companies called upon to help, because of its long experience in manufacturing and installing communications equipment. To let the public know about Western's part in national defense as well as its place in the Bell System, we published the advertisement at the right in selected national magazines.

WESTERN ELECTRIC
TELEPHONES . . . and things we can't talk about
We at Western Electric don't like to be secretive . . .
But at the present time we're working on some of Uncle Sam's newest electronic weapons of defense. Radar systems — guided missile control systems — special military communications equipment — things about which, naturally, we can say little or nothing.
In the past 72 years as manufacturing unit of the Bell Telephone System — Western Electric has developed unique skills and manufacturing techniques that fit us for the important defense work we have been called upon to do. We're going full speed ahead on it along with our regular job. That job is to make dependable telephone equipment that will help your Bell telephone company to serve you well, at the lowest possible cost.
Western Electric
A UNIT OF THE BELL SYSTEM SINCE 1882

GENERAL CABLE

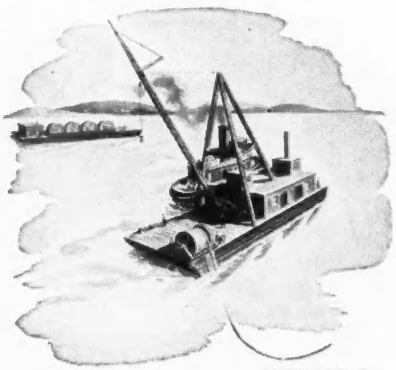
THE GREATEST NAME IN ELECTRICAL WIRE AND CABLE

Paper Telephone Cable



UNDERGROUND

AERIAL



SUBMARINE

BILLIONS OF PAIRED FEET ALREADY ON THE JOB

The country's only supplier of a complete line of telephone wires and cables, General Cable has, for more than 25 years, been the prime independent supplier of paper telephone cables to the independent telephone companies.

Measuring this fact another way, many billions of paired feet of our paper telephone cable are currently in service for aerial, underground, and submarine installations. Consider this as evidence, if you will, of complete dependability under every type of operating condition.

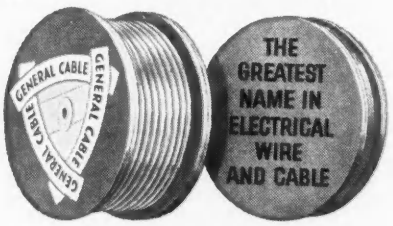
For full-line availability of paper telephone cable, check these General Cable types:

Aerial and underground duct service...paper insulated with lead sheath.

Direct earth burial...paper insulated, lead sheath, with jute or steel tape armor and jute.

Submarine installation...paper insulated, lead sheath, with round steel wire armor and jute.

All of the above types are manufactured in small sizes with concentric and in large sizes with unit construction. Composite and quad constructions available.



For information and service please refer to our national distributors:

AUTOMATIC ELECTRIC SALES CORPORATION • CHICAGO, ILL.

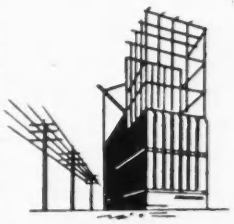
LEICH SALES CORPORATION • CHICAGO, ILL.

GENERAL CABLE CORPORATION 420 Lexington Avenue, New York 17, New York

Sales Offices: Atlanta • Buffalo • Cambridge (Mass.) • Chicago • Cincinnati • Cleveland • Dallas • Detroit Houston • Indianapolis • Kansas City • Los Angeles • Milwaukee • Minneapolis • Newark (N. J.) • New York • Philadelphia Pittsburgh • Portland (Ore.) • St. Louis • San Francisco • Seattle • Syracuse • Tulsa • Washington, D. C.

INDUSTRY OUTLOOK

"Vital news is not what has happened. Vital news is what is going to happen."



EXPANSION:—American Telephone & Telegraph Co. and its subsidiaries which spent $1.4 billion on plant expansion in 1953, "plan to go right ahead on a similar scale" during 1954.

Cleo F. Craig, AT&T president, outlined accomplishments and plans in a year-end review.

"We have had a busy year and expect another in 1954," Mr. Craig said. "The telephone construction program in 1954 will continue to be heavy."

"Last year we made substantial progress toward giving all our customers the kind of service they want, when and as they want it, but there is still much more to be done," he said. "More than 430,000 persons are waiting for telephones and more than a million party line customers want individual lines or lines that they would share with fewer other people. On top of this is the continuing new demand for service."

This new demand, Mr. Craig noted, slackened slightly toward the end of 1953 but remained heavy.

AT&T highlights of 1953, as Mr. Craig listed them:

Full-scale production of Nike, the new anti-aircraft guided missile for city defense, developed by Bell Telephone Laboratories, has been begun by Western Electric Co., Bell System manufacturing unit.

Initial steps were taken in the three-year job of laying the first transatlantic telephone cable.

Extension of coaxial cables and microwave facilities permitted doubling the number of television stations.

Customer dialing on long distance calls was extended to two more exchanges and will be established in a score or more exchanges in 1954.

"There are but few proverbial sayings that are not true, for they are all drawn from experience itself, which is the mother of all sciences." — Cervantes.

TOLL SALES:—Toward the end of 1953 the Bell System began the sales promotion of toll message service. This marked the first time in 12 years that "selling" efforts could be undertaken.

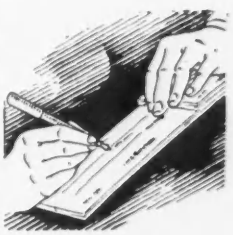
When promotional activities were discontinued in 1941 due to wartime circuit shortages, it was expected that selling would be renewed after the war. Thus, the Long Lines department of AT&T, in cooperation with the Associated Companies and the O. and E. Department, laid the ground work for new, improved sales procedures. The development and research work — including a field trial of procedures — was substantially completed in 1950. Since then, procedures have been held in readiness pending the need for stimulating business.

Until the second half of 1953, toll message volumes were running well above the levels of each preceding year. Now, however, they have declined to the point where in recent weeks the number of daily messages has been at about the level of a year ago, and on many days, below that.

An outstanding job has been done in providing an increase of more than 25 per cent in Long Lines circuit facilities during the past year. This, in turn, has resulted in improved service to customers. The time has now come, it appears, to begin stimulating long distance usage so that full utilization may be made of the plant additions of recent years, together with the plant to be completed in connection with the 1954 program.

Sales forces are now being organized by the Associated Bell Companies to begin selling at once, and Long Lines area and field Commercial offices have designated personnel to join the Associated Companies in activating toll sales promotion. An advertising program is also being developed to help stimulate toll usage among both business and residence users.

"A well-governed appetite is a great part of liberty." — Seneca.



TAX AID: — Relief from taxes and from labor domination would be more helpful to small business than all the credit the Government could provide at the expense of that "vague entity commonly known as the taxpayer. That is the verdict of the *Guaranty Trust Co. of New York*, which devoted a large section of its December survey to answering the question: *"What Does Small Business Really Need?"*

Without mincing words, Guaranty Trust said, "by easing the small business man's tax burden the Government could allow him to improve his financial position without credit through plowing back earnings."

As to labor, the bank said that the small business organization needs protection from "labor organizations which, with governmental aid and protection,

have become so much larger and so much more powerful than the business enterprises themselves that they sometimes hold the latter at their mercy." The review says:

"Many small businesses have been deprived of the right to bargain with their own employes. They must do what the union says, regardless of local conditions or their employes' wishes. Such conditions are possible because labor organizations have been given exclusive immunity to the anti-trust laws, which are designed to curb excesses and abuses of economic power."

The Guaranty Trust postulates that since the supply of capital and labor is limited and the number of persons who would like to use them is large, any attempt to circumvent this reality of survival of the fittest by means of credit not only is a tremendous waste of economic effort, involving heavy financial losses, but in the light of experience hasn't ever worked.

It says that the experience of the banks in the liberal lending days of the 30's shows that not many applicants for loans that normally couldn't be had through the usual channels were worthy of credit.

It cites the verdict of Jesse H. Jones, former RFC head, who said that the majority of requests for credit aid came from those with no record of successful experience and little prospect of earnings.

It points to the experience of the Federal Reserve Bank of New York in making direct industrial loans; only 10 per cent of the applicants got the money and only half of them improved their positions financially. Finally, it cites the recent National Association of Manufacturers' questionnaire which revealed that what small business wanted most was not credit but tax relief, with 23 per cent of all firms wanting only to be let alone by the Government. Only 9 per cent wanted Government loans.

"Nothing will ruin the country if the people themselves will undertake its safety; and nothing can save it if they leave that safety in any hands but their own." — Daniel Webster.

PROFITS: — The total of corporate profits, in the post-World War II period up to June 30, 1953, reached the enormous figure of over a quarter of a trillion dollars. However, the lion's share — almost half — went to the government in taxes. Only one-eighth of the profit total was available for helping to pay the cost of post-war expansion programs.

The 120 billion dollars paid in taxes came to about 46 per cent of total profits before tax. This overall percentage is the net result of tax-rates of 38 per cent in the early post-war years and tax rates of over 50 per cent in more recent years.

Dividends have been well below the levels which might have been expected in these boom years. The $59 billion total for the 7-½ years 1946 through June, 1953, came to only 3.3 per cent of the national income in the same period. In the 1930's the corresponding percentage was 6.0 per cent.

It is not generally realized that a substantial part of reported post-war profits was needed merely to replace the assets used up in current production. Depreciation allowances, which are based on original cost, are insufficient to provide for replacement of capital assets at present prices. The difference has to be made up out

of profits. A further burden on profits results from the fact that inventories have had to be replaced at continuously rising prices. About $49 billion of the profit total went for meeting these two requirements.

The $33 billion left for expansion of assets has not gone very far in meeting the cost of recent business growth. Corporations had to borrow an additional $80 billion for financing their expansion programs in the same years.

"Nothing distributes wealth like taxation and a large family." — Banking

GROWTH:—Substantial growth in coming years was forecast for the American Telephone & Telegraph Co. last month by *J. J. Scanlon*, treasurer, in a talk before the New York Society of Security Analysts.

Commenting on the possible effect of a business recession on Bell System business, Mr. Scanlon called attention to offsetting factors such as the large number of households still without telephone service, the increase in the telephone habit, the small increase in the bill for telephone service in relation to the rise in the cost of living, and the fact that no direct effort has been made to stimulate demand, such as a second telephone in the home.

Opinion was expressed that the 1954 construction program would be about the same as in 1953 when $1.4 billion was spent. During 1953 a total of $800 million of new money was needed but the speaker stated that he did not know how new money would be raised this year.

Financing of the $10 billion of postwar construction required raising of $6.1 billion. This total was described as $3 billion coming from debt financing. $2.6 from conversion and $.5 billion from such sources as sale of stock to employes. Excluding the $600 million issues

just sold, 93 per cent of all convertible debentures have been converted to date.

Debt ratio, which at the close of 1949 was 54 per cent, was stated to be down to 41 per cent before the new issue and it was predicted that the ratio might again be 38 per cent by the end of the March quarter if conversions are good.

Pointing to future developments which should aid the company he cited progress in long distance service such as direct customer dialing, work of the transistor, automatic accounting, color television and progress at the Bell Laboratories.

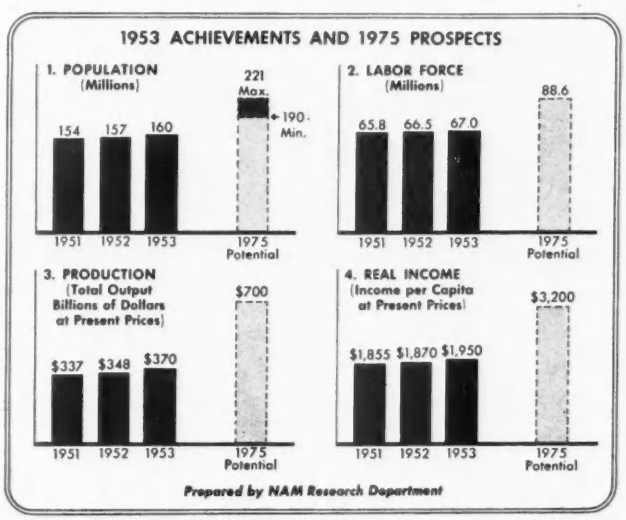
"The trouble is that nations never beat all their swords into plowshares; they always beat a lot of them into axes to grind."

GOALS FOR 1975: — The American economy reached new highs in 1953, both in respect to the size of the population it served and the quantity of goods it turned out. A survey of future prospects suggests that its long-term growth can carry the U. S. to levels far above those already attained.

The goose that lays the golden eggs of economic progress can of course be killed, either by external aggression or by domestic folly. But, barring these eventualities, there is every reason to expect that by 1975 the U. S. will have a much larger number of Americans enjoying a much better standard of living. To bring this about requires no unprecedented miracle, but only a continuation of growth under free competitive private enterprise.

Of course, the future is always uncertain. But a recent analysis of past trends and a consideration of the possibilities of the future outlined roughly the broad magnitude of the American economy in 1975. The accompanying charts of U.S. growth potentials to 1975 were prepared by the Research Department of the National Association of Manufacturers. The charts indicate:—

(1) U.S. population in 1975 will reach 190 million — 30 million more than at present. Other estimates forecast increases up to twice this amount — to a level possibly as high as 221 million.



(2) The high birth rate in recent years makes it inevitable that, as these children mature and look for jobs, the U.S. will have a greatly increased labor force by 1975. Present indications are that a net increase of 22 million persons will be added to the labor force by 1975.

(3) Historically, total U. S. production of goods and services has increased at an average rate of about 3 per cent per year. Experts see no reason why the future growth need be any less rapid. If this potential is realized, total output should be about 700 billion dollars annually in 1975. This is nearly twice the present rate of output.

(4) If expectations outlined previously are realized, incomes should increase in dollars of today's buying power, from about $1,950 per person to about $3,200 per person. This means $3,200 on the average for every man and woman (whether active or retired), every child, and every baby.

"If we apply the same resourcefulness and ingenuity and courage that have been a part of building industrial America in the past, I believe we can look forward to new horizons in the development of America in the future."—HAROLD C. McCLELLAN, president of NAM.

LABOR: — The 16-member Executive Board of Communications Workers of America (CWA) meeting last month in Atlanta, Ga., mapped collective bargaining plans for 1954, voted to consider affiliation with the Postal Telegraph & Telephone International (PTTI) — a free world organization of unions in the communications field — and rapped President Eisenhower's proposals for changes in the Taft-Hartley Law as a "snare and a mockery."

Hospitalization and surgical benefits — paid for by the company — comprise a major goal of the union this year. In addition to basic wage demands, the union has included improved pensions, shorter progression schedules, reduction in length of certain tours, upgrading of certain jobs, and elimination of area differentials as aims for 1954. North-South wage differentials were cited particularly at the Executive Board session.

In deciding to emphasize health insurance in its 1954 negotiations, the CWA pointed out that health insurance is becoming more and more common as time goes on.

On Taft-Hartley, the CWA Executive Board said it wanted, instead of the President's proposal, "a fair and equitable labor-relations law based on the principles of the Wagner Act."

Regarding affiliation with the PTTI, which operates in cooperation with the International Confederation of Free Trade Unions, the Executive Board "approved the idea of participation in the affairs of PTTI" and authorized CWA President Joseph A. Beirne to "secure from PTTI all documents necessary to effectuate CWA participation."

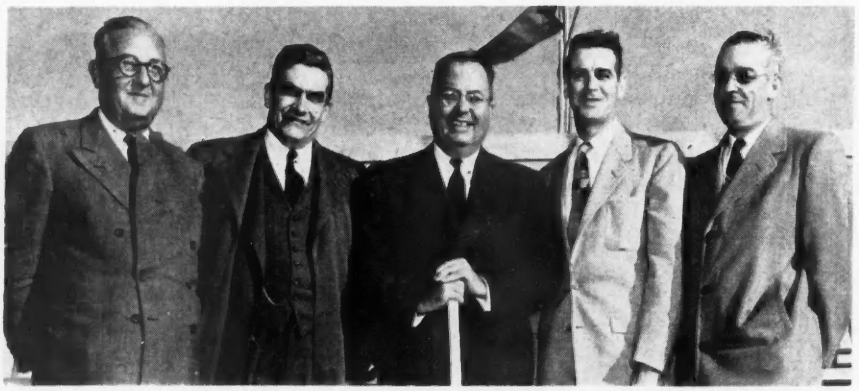
"It is not the facts which guide the conduct of men, but their opinions about facts; which may be entirely wrong. We can only make them right by discussion." — Sir Norman Angell.

TELE-VIEWS

PAUL N. MALMGREN (above) has been appointed general plant superintendent of General Telephone Co. of Indiana, Inc., Lafayette. Mr. Malmgren replaces FRANK HOFFMAN, who has been elected vice president and general manager of General Telphone System's Bluefield (W. Va.) Telephone Co. Mr. Malmgren has been employed by General Telephone Co. of Indiana for the past 15 years.

A. D. KNOWLTON has been appointed director of design engineering of Bell Telephone Laboratories, New York City. He succeeds M. R. Cook who was recently elected a vice president of the Laboratories. He has specialized in the field of design of Bell System equipment and systems. In 1950 he was appointed director of systems engineering and in 1951 to his present post as director of facilities development.

Election of GEORGE G. QUATMAN (above) to the board of directors of the Ohio Independent Telephone Association was announced last month. Mr. Quatman, who is president and general manager of the Telephone Service Company of Ohio, Lima, has had a long and distinguished career in Independent telephony.



GROUND BREAKING CEREMONIES officially beginning construction of the new headquarters building in San Angelo, Texas, for the General Telephone Co. of Southwest were held December 7. Officials participating in the ceremonies were (l. to r.) DON HUNSAKER, vice president, General Telephone Co. of the Southwest; WALTER G. WRIGHT, president, General Telephone Company of the Southwest; DONALD C. POWER, president, General Telephone Corp.; R. PARKER SULLIVAN, operating vice president, General Telephone Co. of the Southwest; and E. C. BRINK, vice president and Controller, General Telephone Co. of the Southwest.

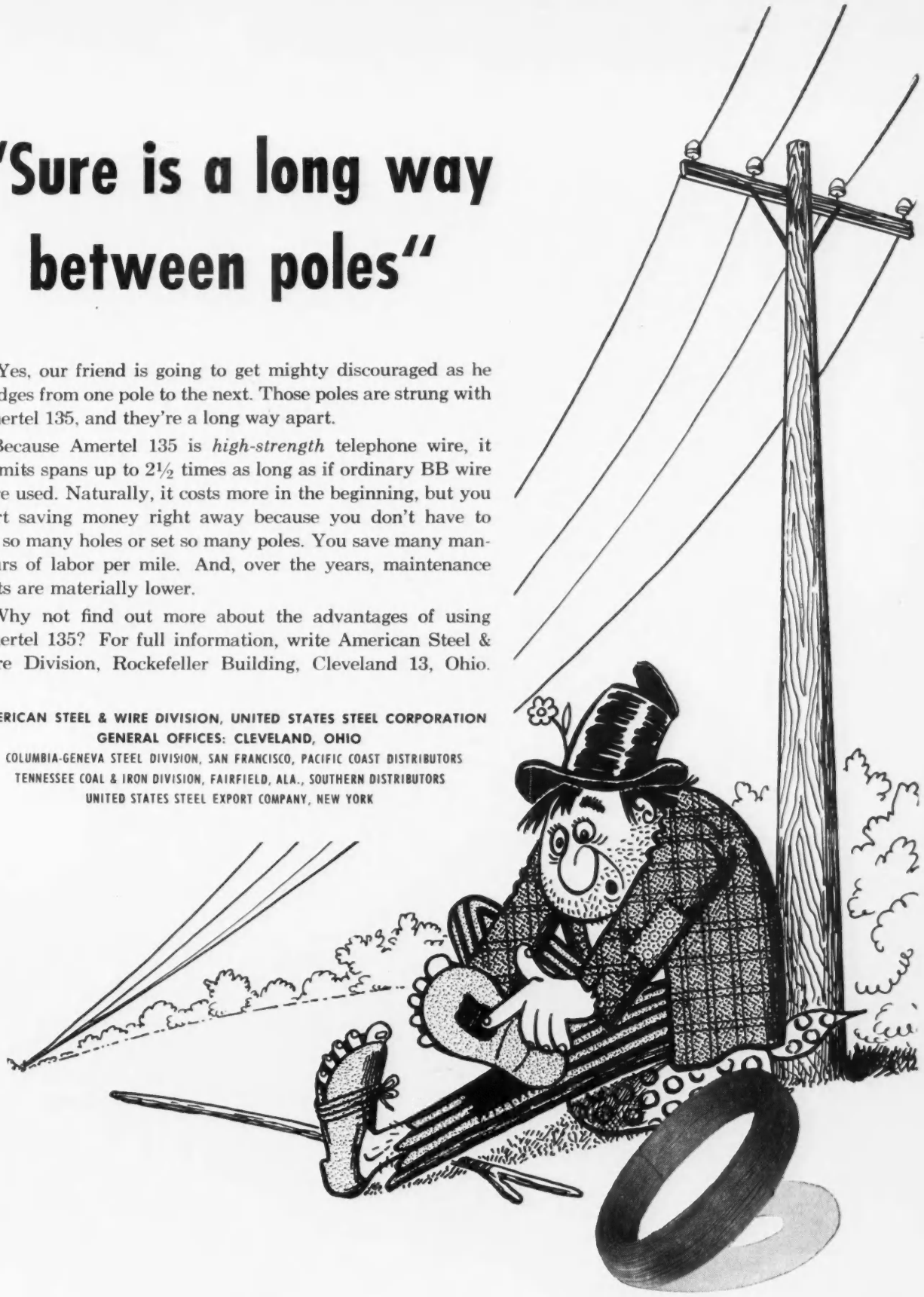
B. H. PIEPMEIER, vice president and general manager of the Community Tel. Co., Black River Falls, Wis., recently awarded service pins to all employes of the Black River Falls District and the General Office employes that had served the company for five years and longer. Special gold pins showing the name of the company and set with a small blue enameled telephone were awarded. Honored guests at the presentation dinner were those shown above that had 30 years of service or more. All service pins to employes having 25, 30 and 35 years of service were set with a small ruby, and the 40-year pins were set with a small diamond. 40-year pins were awarded to AGNES BUTTON (rear right) and JESSIE BARNEY, (left front). A 35-year pin was awarded to MATTIE BUTTON, (front right). 30-year pins were awarded to CARL CADBY (rear center); PEARL HAYES (front center); and MINNIE BLENCOE (left rear).

"Sure is a long way between poles"

• Yes, our friend is going to get mighty discouraged as he trudges from one pole to the next. Those poles are strung with Amertel 135, and they're a long way apart.

Because Amertel 135 is *high-strength* telephone wire, it permits spans up to 2½ times as long as if ordinary BB wire were used. Naturally, it costs more in the beginning, but you start saving money right away because you don't have to dig so many holes or set so many poles. You save many man-hours of labor per mile. And, over the years, maintenance costs are materially lower.

Why not find out more about the advantages of using Amertel 135? For full information, write American Steel & Wire Division, Rockefeller Building, Cleveland 13, Ohio.



AMERICAN STEEL & WIRE DIVISION, UNITED STATES STEEL CORPORATION
GENERAL OFFICES: CLEVELAND, OHIO
COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO, PACIFIC COAST DISTRIBUTORS
TENNESSEE COAL & IRON DIVISION, FAIRFIELD, ALA., SOUTHERN DISTRIBUTORS
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

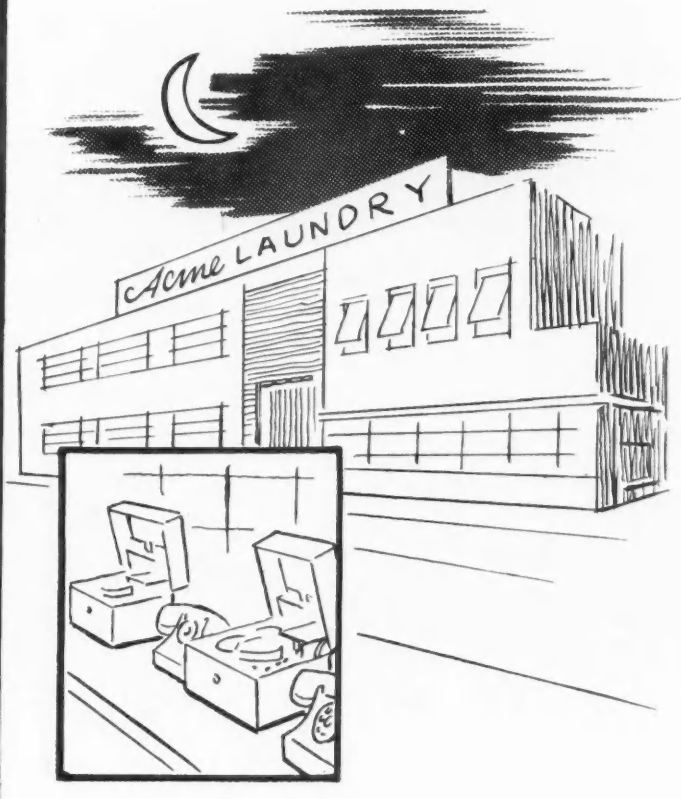
U·S·S *Tiger Brand* AMERTEL

TELEPHONE & TELEGRAPH WIRE

UNITED STATES STEEL

The orders keep pouring in—

DAY... | AND NIGHT



"Competition was breathing down our necks," says the owner of this huge laundry. "We had to do something different—offer something 'extra' that would make our service outstanding—and we found the answer in Peatrophone night order service.

"People were enthusiastic about this service from the beginning. Business women, especially, found it convenient to be able to phone after hours. Peatrophone night order service not only provided us with the 'extra' we needed, but it also brings us a substantial amount of new business each week."

Recently, the laundry has been using Peatrophones during the day too. When the clerks complained that it was impossible to handle so many phone calls during the morning rush hours, the Peatrophones were switched on to answer the phones and take messages. Confusion was eliminated and customers get excellent service without waiting.

Like the Acme laundry, many firms find that putting Peatrophones to work day and night, provides "extra" customer service that costs almost nothing, and pays big dividends.

Be sure to let *your* subscribers know about Peatrophone's many uses in large concerns — taking over in emergencies, relieving overburdened personnel, and working after hours. And don't forget that Peatrophones show up on the profit side of *your* ledger too — in the form of steady new revenue for your company.

Write today for complete information and literature on Peatrophone — your new source of revenue.

Note*: *Selective harmonic ringing subsets now available — all frequencies.

TELEPHONE ANSWERING & RECORDING CORP.
342 Madison Ave. New York 17, N. Y.

PRESENTS A SPECTACULAR ADVANCE *Thompson*

IN

RIGHT-OF-WAY BRUSH CLEARANCE

BROAD SPECTRUM BRUSH KILLERS

Fortified with patented H. S. 31 to deliver extra creep for extra kill.

Thompson Broad Spectrum 2,4-D—2,4,5-T brush killers set a new standard for ease of application, more effective killing action and more economical results in brush clearance. Now your crews need no special technical skills—they simply mix and spray. Hard woods—all species—brush or weedy growth—powerful broad spectrum Thompson brush killers of controlled volatility remove the hazard of "chancey" effectiveness. Foliage spray or basal bark application, you get more kill per gallon and more gallons for your dollars.

Thompson Chemicals

Latest technical data free. Write for station paper No. 12

Thompson **CHEMICALS CORPORATION**

3028 Locust Street, St. Louis 3, Mo.
3600 Monon Street, Los Angeles 27, Calif.

representatives in principal cities

FIRST NAME IN BRUSH KILLERS

PLANT NOTES

By RICHARD ALLEN

"Over the years, technical advances have made it possible to build more efficient facilities."

SAVINGS THROUGH RESEARCH: — A large savings in the use of raw materials is resulting from the Bell System's 1800-channel voice transmission system now operating between New York and Philadelphia and soon to be extended to Chicago. A similar system operating on a transcontinental basis would use only 1500 tons of copper and 4300 tons of lead, compared with the 81,000 tons of copper and 158,000 tons of lead consumed by the one-channel transcontinental system of 35 years ago.

MICROWAVE: — Linking New York and Boston via seven hilltop towers, AT&T's Long Lines placed in service its first radio relay route six years ago. From these first seven towers, the microwave network has grown steadily larger. Today in 35 states, Long Lines has more than 350 radio relay stations and over 52,000 channel miles of microwave facilities helping to handle the public's demand for long distance service and to provide channels for network TV broadcasts.

NEW TYPE BOOTH: — A new type of telephone booth — one that leaves both hands of the caller free while making a call — was placed in service last month at the South Station, Boston, Mass.

It's the only telephone of its kind in public use in the entire country, and was installed as a Bell Telephone Laboratories' trial — to see how people like it. There is no plan to place any similar telephones in service anywhere else for the present. For the time being the whole thing is an experiment.

Developed by the Bell Telephone Laboratories, the new equipment is being tested jointly by the Laboratories and the New England Tel. & Tel. Co.

In place of the familiar public telephone instrument, with its dial and coin box, the new test booth comprises a recessed speaker and microphone in the soundproofed walls of the booth. A switch and a knob to control the sound volume are the only controls needed, and the person using the booth can both speak and hear without holding an instrument to his mouth or ear. Such a telephone might be useful to people who have papers or books to consult or notes to write while making a call, or to those with physical impairments making it difficult to use their hands.

For the present, such an installation can only be made at a place where an attendant is on duty to handle calls, since there is neither a coin box nor a dial in the experimental booth. The attendant places the call, and the calling party pays the attendant after he has finished his call.

While telephone engineers are making exhaustive tests of the technical performance of the new equipment, those who use the booth will be invited to express their opinions of its convenience. The test is a part of the Bell System program of development and testing facilities for improved voice communication.

WINTER DRIVING: — Driving a car during stormy weather is never pleasant, but experts in the traffic department of the American Automobile Association (AAA) say that the trouble, strain and danger can be considerably lessened if the driver prepares himself and his car.

Here are some suggestions:

Slow down when the weather is bad. Facts and figures according to the AAA prove that at 20 miles an hour on dry concrete the total stopping distance is 52 feet. On hard-packed snow it is 90 feet, and on glare ice, 249 feet.

To slow down, make a turn, or stop on ice or snow, pump the brake slowly instead of applying all the pressure at once. When road conditions are bad, allow extra space between your car and the car ahead.

Keep your windshield and windows clear. If your car is parked outdoors during a storm place a cardboard or several sheets of newspaper over the windshield and hold with the wiper blades.

Be careful when parking. If your car has conventional gearshift put it in reverse — the strongest gear — whether it is headed up hill or down, and cut the wheels toward the curb. If your car has automatic transmission, place the gears in locking position specified for the car.

No matter how cold it is, be sure to ventilate the car. Odorless carbon monoxide is likely to be present when your car is completely sealed.

Tires with extra-deep tread are a great help in winter driving, but skid chains with tighteners to keep them in place offer greater safety and reliability. Driving with two wheels on soft snow of the road's shoulder will help you get up a slippery hill, but if you get caught in a snowbank don't try to race your car out. Rock it back and forth until the car can move out on the track you've made. Don't race your engine. It won't do a bit of good and it may burn out the clutch and ruin the tires.

Here's Proof of Performance...

These Creosoted poles are still in service 25 years after installation

• Located near Pontiac, Mich., a four-mile sub-transmission line of Detroit Edison Company offers excellent testimony of Creosote's effectiveness as a wood preservative.

In 1929, 141 Creosoted poles were installed in this section. To date, 23 poles have been replaced . . . 22 of them due to road widening, lightning damage, vehicle accidents, and the like. Only one was lost to wood's natural enemies.

What's more, Detroit Edison reports that maintenance costs on these poles treated with Creosote are negligible. An official remarks, "They require nothing more than periodic checking—a big factor when maintenance costs can be a big chunk of operating expenses."

Thanks to service records like this—established in nearly a century of use—you *know* you can depend on Creosote as a wood preservative.

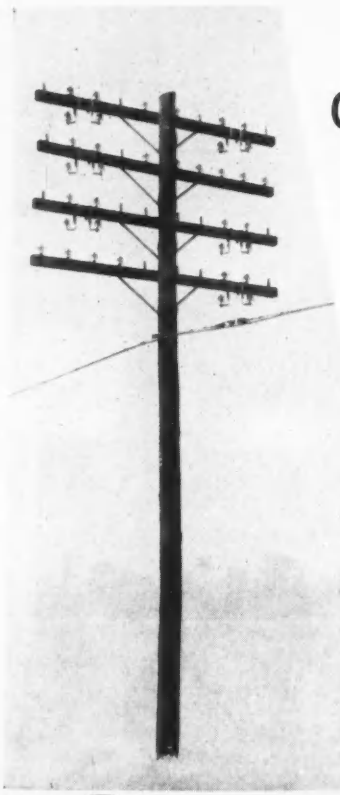
And you have extra assurance when U·S·S Creosote is used, for it is a uniform product made to give you uniformly good results. For complete information, contact our nearest Coal Chemical Sales office or write directly to United States Steel Corporation, 525 William Penn Place, Pittsburgh 30, Pennsylvania.

HERE are some of the Creosoted poles in Detroit Edison's sub-transmission line near Pontiac, Mich. Three-fourths of the poles in the Detroit Edison system are protected by Creosote.

U·S·S CREOSOTE

USS

UNITED STATES STEEL

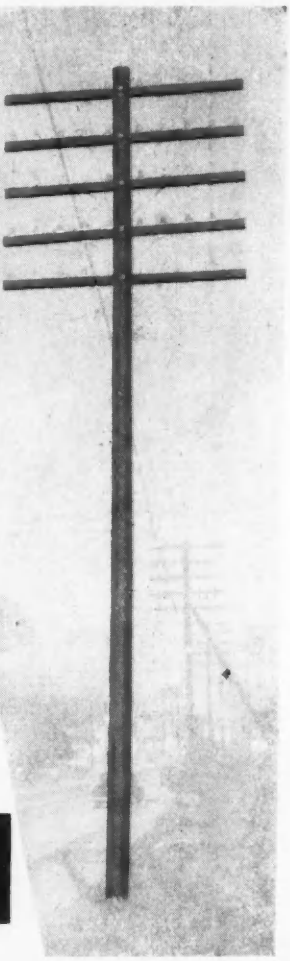


MORE THAN A QUARTER CENTURY PROGRESS IN POLE PRODUCTION

On the left is a Taylor-Colquitt pole set 26 years ago. Still sound and serviceable, it nevertheless stands in sharp contrast with one on the right which was recently installed.

For to good timber and good treatment have been added many improvements and refinements during the years that have passed. In such things as timber selection, machine trimming, vapor drying and precise treatment, Taylor-Colquitt has set constantly higher standards to insure that Taylor-Colquitt poles shall always be the best that can be obtained.

Taylor-Colquitt poles are distributed to independent telephone companies exclusively by Automatic Electric Sales Corporation, 1033 W. Van Buren St., Chicago 7, Illinois

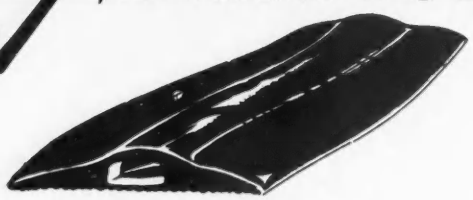


TAYLOR - COLQUITT CO.
SPARTANBURG, SOUTH CAROLINA

PLANTS AT SPARTANBURG, SOUTH CAROLINA AND WILMINGTON, NORTH CAROLINA

Do you know these facts about

FLEXIDUCT?



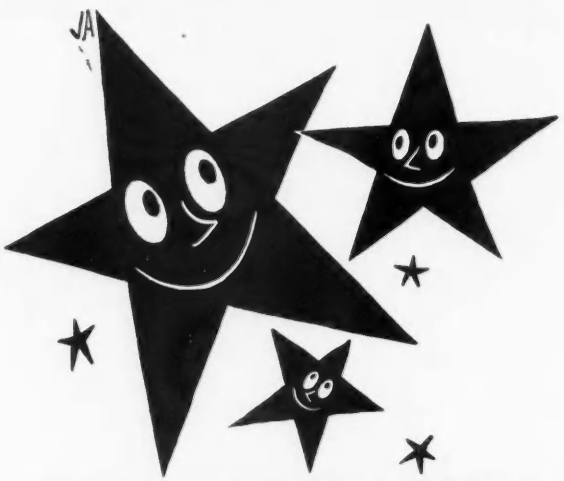
It's the new rubber floor duct that solves over-floor wiring problems quickly and effectively, with adequate protection from sweepers, mops and equipment on casters. Installation is easy and permanent. You just fasten Flexiduct in place with its own special cement. There's no drilling or necessity to use screws and fasteners. Flexiducts' flexibility allows it to adhere evenly and securely to all types of floor surfaces and it is adaptable for installations ranging from 2 conductors to 25 pair switchboard cables. Write for complete information regarding Flexiduct and your wiring problem today.

•

Export Agents | Ericsson Telephone Sales Corp.
100 Park Ave. New York 17, N.Y.

For further information, write for circular 753 A.

BUCKEYE TELEPHONE & SUPPLY COMPANY
1250 KINNEAR ROAD Kingswood 0655 COLUMBUS OHIO



WHATEVER ITS SIZE

no directory is too small to deserve — and get — all of the skill that goes into QUALITY PRINTING *at*

The Lakeside Press

R. R. Donnelley & Sons Company

350 East Twenty-second Street, Chicago 16

POWERS *American*

SERIES HD-1

"Pole-Master"

fully-powered HYDRAULIC DERRICK

- LIVE BOOM — CAN BE OPERATED UNDER LOAD
- INFINITE OPERATING POSITIONS
- REQUIRES ONLY SINGLE-DRUM WINCH
- LIFTS LOADS TO BODY PLATFORM
- NO CENTER LEG TO OBSTRUCT BODY CARGO AREA

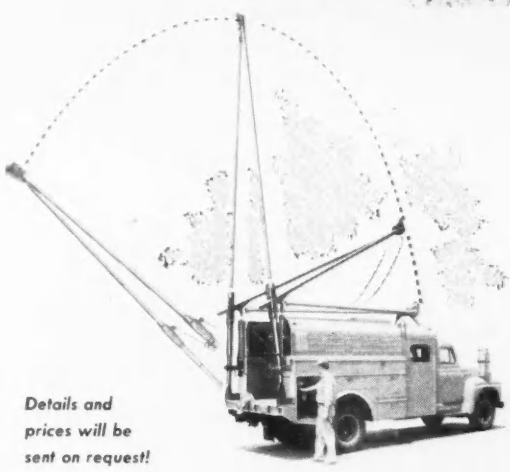
"The Accepted Standard with Utilities Everywhere"

Operation of the Series HD-1 derrick is *completely hydraulic.* It is raised to working position, elevated or lowered to desired height, and returned to carrying position . . . hydraulically.

There is no mechanism to endanger workmen — no center leg to obstruct the body cargo area — no manual operation, other than insertion and removal of locking pins, and shifting of hydraulic control levers.

This is a *heavy-duty* derrick which will handle poles up to 55 ft. in length — under the most severe operating conditions.

Capacity, with head sheave 5′ to rear of body, is 6000 lbs. When extended to 14′, capacity is 2500 lbs.



Details and prices will be sent on request!

THIS IS A *"Live Boom"* DERRICK

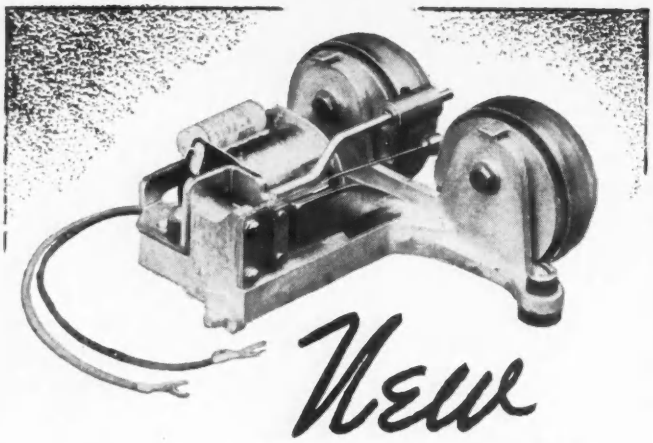
There are no pre-determined "stops" to limit operation of the derrick. It can be spotted in an unlimited number of positions, and moved at any time — even while supporting a full load.

Twin hydraulic rams raise the derrick from carrying position to working position in less than a minute. When derrick is spotted, a poppet-type control valve seals oil in cylinders to prevent "kick back" or "creeping".

POWERS-AMERICAN DIVISION

McCABE-POWERS AUTO BODY COMPANY

5900 NO. BROADWAY • ST. LOUIS 15, MO.
428 LATHAM SQ. BLDG. • OAKLAND 12, CALIF.



New

HIGH IMPEDANCE RINGER GIVES OPERATING ECONOMY

For harmonic, synchromonic and decimonic frequencies

This new USI engineering approach contains all the outstanding basic features of the new Western Electric type C straight line ringer while making available equally superior multi-frequency ringers. USI ringers are especially designed for use in the new W.E. No. 591 sets to provide selective ringing in five frequencies in harmonic, decimonic or synchromonic series.

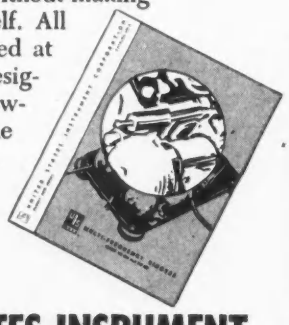
Economy: Since USI ringers are designed to operate on low currents with high impedances of approximately 100,000 Ohms at 400 cycles and 400,000 Ohms at 1000 cycles, many operating economies are possible. As many as ten ringers may be bridged on a single line. Costly trouble shooting, especially of marginal lines is reduced considerably.

Resonant Frequency is obtained by a new principle using a small clapper on a flexible arm to strike the gongs and a separate resonant weight on a vibrating arm to maintain resonance. This design, together with rugged construction, reduces maintenance costs to a minimum.

OTHER FEATURES...

Stability of USI ringers during a long life – 200 hours continuous ringing.

Improved Ringing Tone of the new W.E. 500 type sets is maintained. A volume control operated by the subscriber is available if desired. Each ringer is a completely self-contained unit designed and constructed to perform in W.E. 591 sets without making any changes in the set itself. All ringers are completely adjusted at the factory to ring at the designated frequency. Only a screwdriver is needed to install the ringer in the W.E. 591 sets.



Ask for ringer folder. *Write Dept. U.*

UNITED STATES INSRUMENT CORPORATION

SUMMIT, NEW JERSEY

COMMUNICATION ENGINEERS ATTENTION!

The world's largest independent supplier of Carrier equipment offers permanent positions, good starting salaries, and unusual opportunity for progress. If you have had experience in any of the following fields, we can make you a very attractive offer:

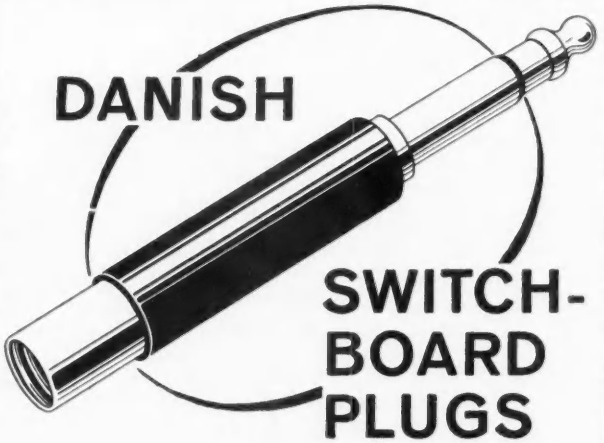
1. **Carrier Transmission Engineering**
2. **Carrier Equipment Installation and Maintenance**
3. **General Transmission Engineering**

Write giving full details of your background to Personnel Director

AUTOMATIC ELECTRIC COMPANY

1033 West Van Buren St.

Chicago 7, Illinois



The plastic insulation injected between the conductors stays solid. It covers the edge of the brass shell, positively preventing cause of most shorts. Invented and used exclusively by TELEFON FABRIK AUTOMATIC A/S since 1912. These plugs provide unsurpassed precision in machining, solidity of construction, and high insulation safety.

Available as replacements for all popular two-and three conductor plugs.

The most popular types are stocked by our sales distributors in U. S.

BUCKEYE
Telephone & Supply Co.
Columbus 6, Ohio

SUTTLE
Equipment Co.
Lawrenceville, Ill.

TELEFON FABRIK AUTOMATIC A/S
COPENHAGEN DENMARK

True Economy...

A RESTATEMENT

In 1945 Whitney Blake Company pointed out to the Independent Telephone Industry that a BETTER wire is far more important than a CHEAPER wire in the economics of telephone drops. TELEPRENE drop wire formed the practical basis for that theory.

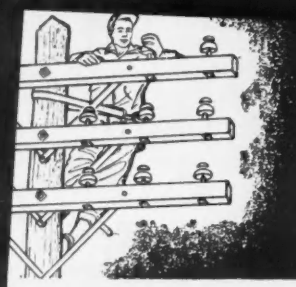
Now, eight years later, as price becomes of greater concern in a tightened economy, there is the increasing temptation to seek savings in wire that is of cheaper construction than the best obtainable.

Let us therefore, reiterate that our policy of making BETTER, not CHEAPER, wire, proven sound over the past eight years, will continue. We say this with the conviction that the foresight and acumen which have made the Independent Telephone Industry grow will continue to lead the majority of telephone men to choose the BEST wire because it lasts longest and offers them . . . TRUE ECONOMY.

WELL BUILT WIRES SINCE 1899

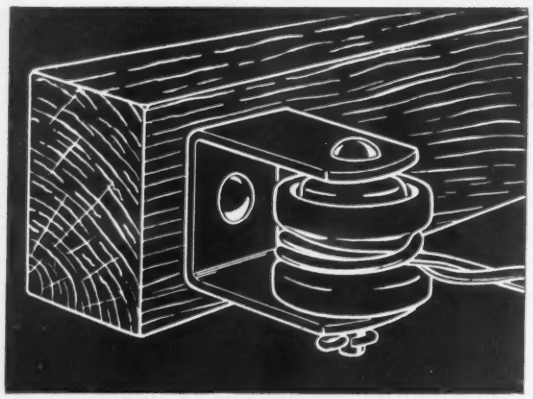
WHITNEY BLAKE COMPANY

NEW HAVEN 14, CONNECTICUT



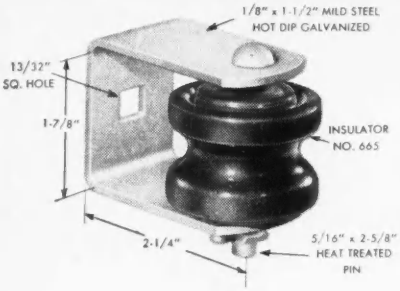
LINE CONSTRUCTION BLUEPRINTS

ITEMS SOME COMPANIES ARE USING TO MAKE LINE CONSTRUCTION WORK EASIER



L-M DEAD END CLEVIS

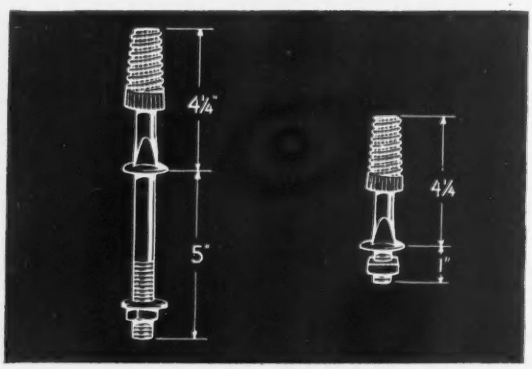
Cat. No. 260084A1



Here's a strong, compact, galvanized-steel clevis which provides a most practical method for dead-ending. May be attached to either pole or crossarm, with a ⅜"-diameter carriage bolt. Square hole keeps clevis from turning. Clevis has ultimate strength of 2500 pounds. Spool insulator (must be ordered separately) will take up to 1500 pounds wire tension.

L-M STEEL INSULATOR PINS WITH WOOD COBS

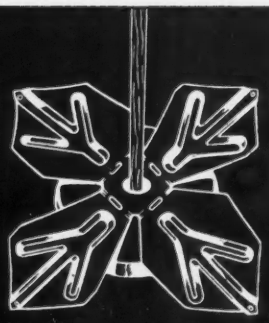
For wood crossarms: Cat. No. 9740, ½" diam.
Cat. No. 9741, ⅝" diam.
For steel crossarms: Cat. No. 9740S, ½" diam.
Cat. No. 9741S, ⅝" diam.



Strong steel pins, hot-dip galvanized, with seasoned oak cobs thoroughly impregnated with paraffin and threaded for 1" insulator holes. Pin for wood arm has square nut and clipped washer; pin for steel arm supplied with square nut only.

L-M 4-WAY PRESSED STEEL EXPANDING ANCHORS

DESIGNED FOR EXCEPTIONAL STRENGTH

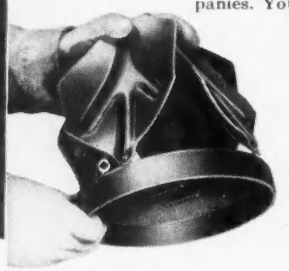


Notice the additional area inside the center of gravity of two opposed blades which gives utmost area for increased holding power, without sacrificing balance of the anchor.

Heavy steel, with skirted edge to prevent deformation. A nut retainer strap welded to the underside reinforces the hole so that the nut cannot pull through the base plate.

Catalog Number	Diameter—Closed—Inches	Expanded Area—Square Inches	Nominal Holding Power Class—Pounds	Anchor Rod Diameter—Inches	Minimum Mechanical Strengths Without Noticeable Deformation—Pounds
200026B1	8	110	6,000	⅝, ¾	16,000
200026B2	8	125	8,000	⅝, ¾	21,000
200026B3	8	132	10,000	1	24,000
200026B4	8	132	10,000	⅝, ¾	24,000

All 3 sizes are REA-approved, and have been thoroughly tested and approved by major utility companies. You can depend on them to hold!



Two-piece design . . . The four blades are formed of a single piece of steel, and are held to the base plate by four small bolts, which simply shear off by tamping. The center hole is extruded downwards. This extrusion provides a bearing surface against the rod to prevent binding; it reinforces the tamping area; and it provides an audible signal when the extrusion strikes the base, indicating full expansion.

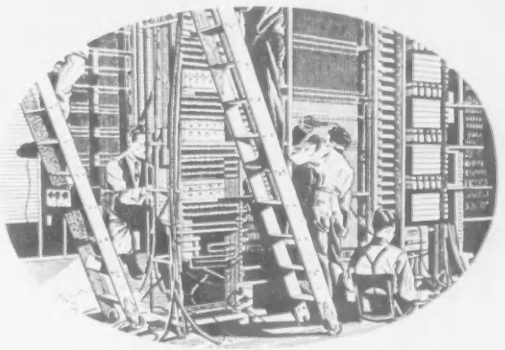
154

Do You Have a Line Construction Problem?

These are just a few of thousands of L-M line construction specialties. If you have a line construction problem, let us know. We may have standard or special items in stock that will solve it. Ask the North Electric or Kellogg representative, or the L-M Field Engineer. Or write Line Material Company, Milwaukee 1, Wisconsin (a McGraw Electric Company Division).

LINE MATERIAL
Line Construction Materials

Sold for L-M
to the independent telephone industry
by
KELLOGG Switchboard and Supply Company
and
THE NORTH ELECTRIC MANUFACTURING COMPANY



Baby Will Need Shoes

WE TAKE OUR text from the situation of a friend of ours who owns a small manufacturing business making various gadgets for use in the home. His products are well and honestly made, reasonably priced, and useful. In consequence, his business has done well over the years.

Some months ago our friend contracted a bad case of jitters over the economic future of the U.S.A. He heard and read so much about a coming recession — or perhaps even a depression — that he became alarmed about the future prospects of his own business.

Like a lot of people who are influenced by all the talk that is going around about a recession or depression, he decided that he had better play it safe, so he postponed the construction of an addition he had intended to make to his plant, and cancelled the orders he had given for machinery with which to equip the added space.

(That, we wish to remark, is the way depressions or recessions are made.)

The other day we met and talked to our friend for the first time in several months. We found him, to our surprise, full of bounce and of enthusiasm about the future.

He had made up his mind, he explained, to do some thinking of his own on this subject of a coming depression or recession. He had started with a study of the growth of population in this country. When he had concluded that study he had decided that there was no need of further studies — and no need also, for worrying about the future of his business.

The population of the United States is growing, he told us, at a rate of around 3,000,000 a year — and that rate is increasing. For instance, there were 4,000,000 babies born in this country in 1953.

The population was estimated by the Census Bureau to be 161,200,000 at the end of 1953. Reliable estimates put the expected population in 1960 at 178,000,000 to 180,000,000.

That means a growth in the number of families from 47,000,000 to 52,000,000 in that period — or at least 5,000,000 new families; possibly many more.

As one student of population put it recently, we add the equivalent in population of a city the size of Omaha every month. In 1953 we added nearly a million new families.

According to the authority quoted, we need right now to spend 500 billion dollars on our school system, highway system, hospitals and other institutions, and so on, just to bring them up to the level of our present population.

So, said our friend, he was no longer worried about the prospects for his business. Five millon or more new families would use a lot of his household gadgets, he was sure.

And, he said, he saw no reason why any other industry should be worried. Take the shoe business, for instance. Four million new babies a year will need a lot of new shoes during their lifetimes.

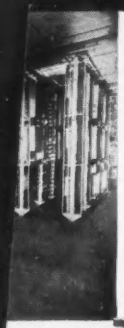
"The United States is the biggest and best market in the world," he said. "I've decided that if my business cannot prosper in it, the trouble is not with the market, but with my business."

We naturally think of this situation in terms of the telephone business.

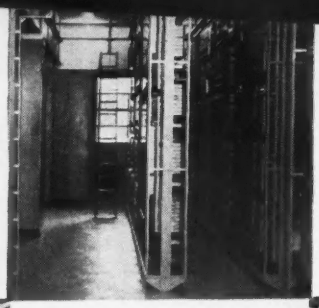
Five million new homes — and some authorities say it will be nearer six million — during the next few years will require a lot of telephones. Then all the businesses that come into being or that grow larger in order to supply and serve these additional homes, will need more telephones also.

It looks like the 50,000,000th telephone will turn out to be just a sort of way point in the growth of the telephone industry. That may be one reason why the telephone industry is not doing much worrying about depressions or recessions.

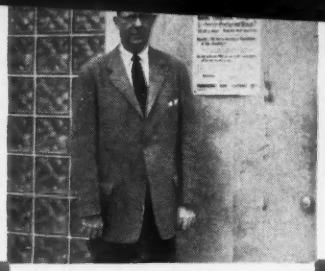
(The foregoing editorial, although copyrighted, may be reproduced in whole or in part, without charge, provided credit is given this publication and a copy of such reproduction is filed with this publication. This legend need not appear on the publication.)



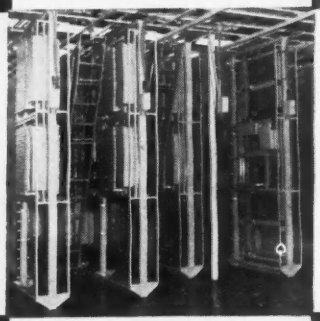
Kingsport, Tennessee



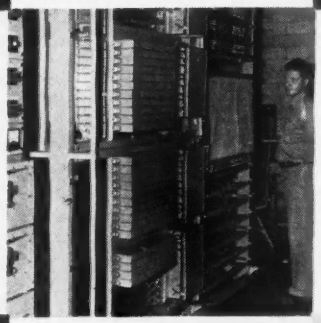
Ovid, N. Y.



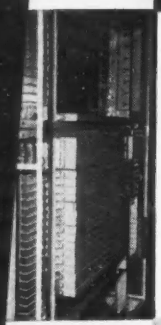
Coeur d



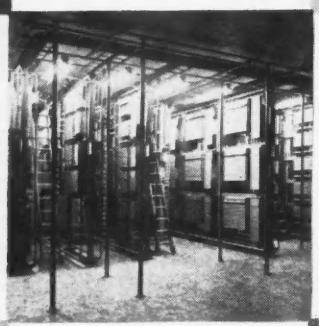
Lufkin, Texas



Villisca, Iowa



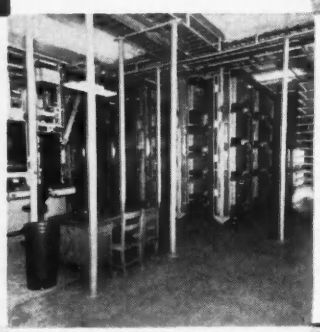
Emmaus, Penna.



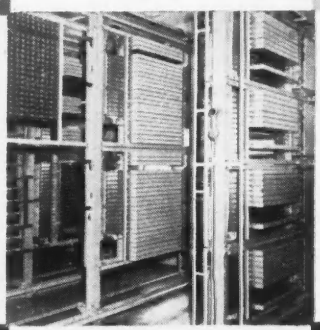
Blair, Nebraska

Ketchik

Melcher-Dallas, Iowa

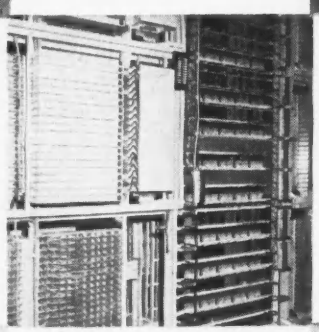


Junction City, Kansas

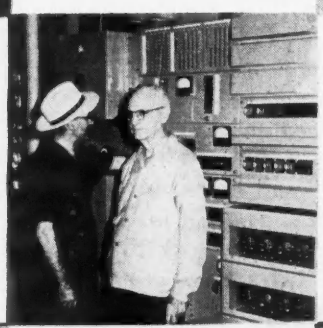


Middleburg, N. Y.

Stephenville, Texas



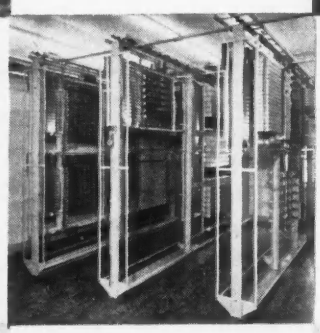
Viroqua, Wisc.



Noble, Okla.

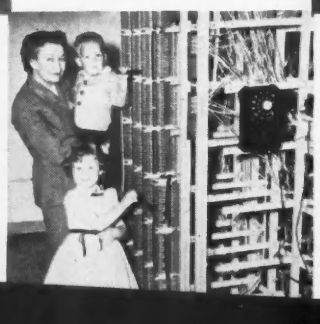
Tavares, Fla.

Coos Bay, Oregon

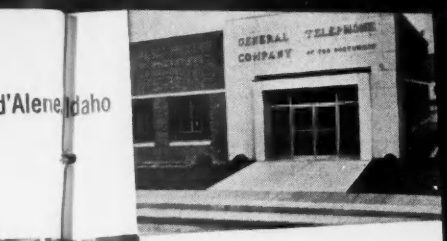


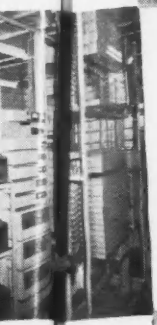
Avon, N. Y.

Patterson, Calif.

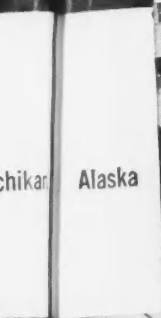


Henderson, Nev.

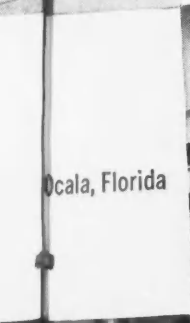




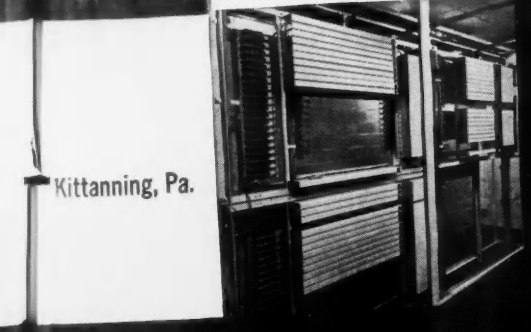
Pleasant Hill, Ohio



Pine Island, Minn.



Silverton, Oregon



Kittanning, Pa.

your best move... Stromberg-Carlson XY®

During 1953 these fine independent companies—and hundreds not listed—chose XY dial for single and multi-office exchanges, after carefully considering every type of system. If you have dial in <u>your</u> future, investigate XY, the most modern, most economical, most ready for the future...most in demand!

Stromberg-Carlson®

ROCHESTER 3, N.Y.

Makers of Famous XY Equipment. Telephones, Switchboards, Sound Equipment and Electronic Carillons; Industrial, Intercommunication Systems; Television, Radios and Radio-Phonographs.

DO YOU KNOW-

The *Reliable* Line will fill all needs for

COMPRESSION SLEEVES?

1. SQUEEZ SLEEVES

For Drop, Bridle and Inside wire-copper, copperweld and bronze

For Solid copper wire

For Stranded copper wire

For solid copperweld wire

For 3-strand copperweld

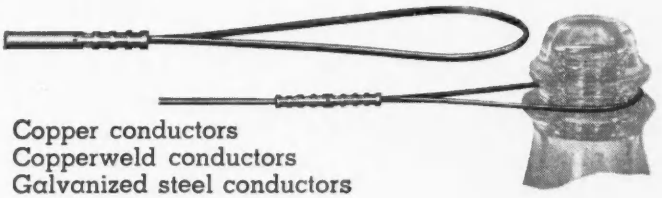
For Galvanized Steel Conductors

2. SQUEEZ TAPS

For copper, copperweld and bronze

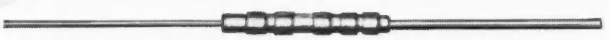
For steel to copper, copperweld and bronze

3. SQUEEZ DEADENDS



Copper conductors
Copperweld conductors
Galvanized steel conductors

4. REDUCING SQUEEZ SLEEVES



Copper to copper
Copper to copperweld
Steel to steel
Steel to AWG Drop Wire

5. REPAIR AND TRANSPOSITION SQUEEZ SLEEVES

For solid copper wire
For Galvanized steel conductors

6. SQUEEZ TOOLS

—made by Reliable to do all jobs—

No. 3AB.

No. 2—CD
CJ or DJ.

No. 1—
MJ or PJ.

All types of Reliable Squeez Sleeves, except Squeez Taps, are internally impregnated with a dispersion of fine, sharp silicone particles to assist holding ability. This patented method is unique and consistent. The electrical properties of a made-up joint are highly efficient. Resistance of a made-up joint is less than an equal length of wire. Benefit from having *One Source* and *One Consistent High Quality!* Ask for Bulletin SS-51, it's a complete sleeve and tool catalog.

RELIABLE ELECTRIC CO.
3145 Carroll Avenue Chicago 12, Illinois

Reliable

Telephone Protective and Terminal Equipment for all Station, Line and Central Office Needs.

OVER 45 YEARS' SERVICE TO THE UTILITIES

From The Capitol—

WASHINGTON BUREAU REPORTS

General Services Administration contracts with Western Union for new telegraph system . . . FCC proposed filing-fee plan . . . REA deserves praise for policy of providing quick answers to all questions.

SIGNIFICANT keys to the thinking of the Eisenhower administration in its efforts to put the federal government on a more businesslike basis, while at the same time accepting the inevitability of some of the overall shift of government activities in the past 20 years, have cropped up in two matters involving communications services.

In one, of General Services administration, the government's "housekeeping" agency, has contracted with the Western Union Telegraph Co. for a new private line telegraph system to serve almost all the federal government's agencies.

In the other, the Federal Communications Commission, on direct orders from the Bureau of the Budget, has somewhat reluctantly issued a proposal under which fees would be charged for applications for grant, renewal, modification, or transfer of licenses and permits issued by the agency.

GSA, for the past 10 years, has been operating a telegraph network between major cities of the nation to handle messages of government agencies, with the exception of certain specialized traffic, such as weather, national security and flight information. The system was started during the height of World War II, and operates over facilities leased from the Bell System.

It has been announced, however, that in about six months GSA will cut over to a new and larger system provided by Western Union. The leased links will connect 51 major cities through 15,000 miles of private lines, with messages to points off the system being handled over Western Union's regular commercial telegraph facilities, as heretofore.

Rental will be about $360,000 a year, GSA Administrator Edmund F. Mansure declared, but he estimated the government will save about $150,000 annually — not from the lease, but because the new system will save government personnel costs, and because it is expanded so in size that the tolls for messages refiled over regular commercial links will not be so much.

Both the American Telephone & Telegraph Co. and Western Union submitted proposals during the months the subject was under study, Mr. Mansure said, and the government benefited from the "genuine free play of competition between both companies." He said that in the final analysis Western Union's proposal "was found better suited to the government's particular requirements and thereby pointed to somewhat larger economies."

The significant thing here is not that Western Union's proposal was accepted over that of the Bell System. After all, Western Union is a telegraph company, and integration of the government network into its overall domestic telegraph facilities offers obvious advantages.

What is more important, as a guide to philosophy in Washington, is that the administration has worked out a revision of past operating practices which saves money and puts the system on a more businesslike basis (as acceptance of either offer would have done), but the government *continues to operate its own telegraph system.*

In what has become known as the "Marshall Plan," President Walter P. Marshall in 1949 offered a number of proposals to put the nation's telegraph system on a sound basis. One of his major points was elimination of competition by the govern-

ment with private telegraph industry.

So now the government will have a telegraph system more suited to its needs, and at less cost, but it will have a telegraph system.

FCC Proposes Filing Fee Plan

THE FILING fee plan, in the opinion of this column, represents another of the long-needed changes in Washington being put into effect relatively quietly by the administration. It is one of the effective but unfortunately little-known answers by the administration to the charges by its opponents that it is not doing anything.

Other recent examples were the announcement by Postmaster General Arthur Summerfield that the New York pneumatic tube mail contract, which goes back a good many years and cost the taxpayers $1,000,000 a year, was being canceled because two mail trucks, at total cost of $25,000 a year, could do the same job; and the move by GSA to survey unused or unnecessary government property, with a view to getting it off the taxpayers' backs and back on the tax rolls.

These are vitally important moves to the taxpayers, and enough of them could cause a significant reduction in taxes or a cut in the national debt without touching what are considered essential government services.

The filing fee plan, which applies to all government agencies issuing permits, licenses, or authorizations of almost any kind to private citizens or business, is based on the theory that all citizens pay the cost of the regulatory activities of the FCC, for example, but that recipients of benefits should pay for the licensing functions.

Making its estimates on the basis of fiscal 1953 figures, the FCC concluded that the plan would bring in about 45% of the money it spent during that fiscal period.

Of course, it is impossible to plan a fee system and still make everyone happy. The Commission's proposal for a flat $325 fee for applications for grant, renewal, transfer, etc., of all broadcast station permits, including television, FM and AM, is bound to attract considerable criticism. The fee probably is much too low for a huge television property and somewhat too high for a red ink-ridden FM station. But the important thing is that, whatever the difficulties of planning an equitable schedule, the net result will be that applicants will pay the cost of the Commission's licensing activities.

In the common carrier field, in keeping with the philosophy of the administration, there will be no charge for tariff filings, for example. But an application to acquire another company, or to consolidate two or more telephone firms, must be accompanied by a $350 fee. A request for authority to extend wire line plant (if the application is a formal one for a project estimated to cost $250,000 or more) will take a $150 fee, as will an application by an Independent telephone firm for exemption from FCC jurisdiction under the Communications Act. By and large, other applications by common carriers will cost $30 each.

In ordering the filing fee systems for the various agencies, the Eisenhower administration was not plowing new ground. Of course, common carriers are charged for state commission regulation in a number of states under various formulas, and the Securtities & Exchange Commission has long charged fees for registering securities issues.

Much has been said by "liberals" about consolidating the social and economic gains which they point to as having taken place over a 20-year period. It is hoped that the next time the pendulum swings back and a Democratic administration takes office again, that some of the benefits currently being hammered out by the Eisenhower administration will not be lost to the countless millions of taxpayers in the nation.

REA Gives Quick Answers to Questions

THE ADMINISTRATION'S representative in another field, Rural Electrification Administrator Ancher Nelsen, continues to answer questions almost before anyone asks them. This is as good a time as any to pay the deserved tribute to Mr. Nelsen, his top assistant, Fred H. Strong, REA press officials, and others for seeing to it that the REA's approach to problems is given the widest possible dissemination, in public addresses, press releases, explanatory bulletins to borrowers, and similar media.

Promptly following up the submission of President Eisenhower's budget to Congress, Mr. Nelsen declared that the $75,000,000 asked by the administration for new farm telephone loan authority in the fiscal year starting July 1 "will be adequate to provide for the sound development of the REA programs. If we should find additional amounts are needed and justified, we shall ask for them."

Meanwhile, Mr. Strong pointed out that the $75,000,000 program is about all that can be handled by the manufacturing, engineering, and construction facilities available for rural telephone work. He noted that another limiting factor is the supply of trained personnel available to borrowers to manage and operate new rural telephone systems. REA's budget request for new telephone loans in fiscal 1955 was planned on this basis, Mr. Strong explained.

Answering other questions, Mr. Nelsen has pointed out that the agency is spending a larger proportion of administrative money, in relation to the amounts borrowed, than

Please Turn To Page 94

Coming Conventions

Kentucky Independent Telephone Association, Phoenix Hotel, Lexington, March 2.

Texas Telephone Association, Texas Hotel, Fort Worth, March 15, 16, 17.

Nebraska Telephone Association, Paxton Hotel, Omaha, March 23, 24.

Ohio Independent Telephone Association, Deshler Hilton, Columbus, March 29, 30, 31.

Iowa Independent Telephone Association, Fort Des Moines Hotel, Des Moines, April 6, 7.

Illinois Telephone Association, Pere Marquette Hotel, Peoria, April 26, 27.

Wisconsin State Telephone Association, Loraine Hotel, Madison, May 5, 6.

National Executive's Conference, Broadmoor Hotel, Colorado Springs, Colo., May 10, 11.

Kansas-Missouri Telephone Associations, Muehlebach Hotel, Kansas City, Mo., May 17, 18, 19.

Pennsylvania Independent Telephone Association, Bedford Springs Hotel, Bedford, May 25, 26.

New York State Telephone Association, Scaroon Manor, Scaroon Lake June 7, 8, 9.

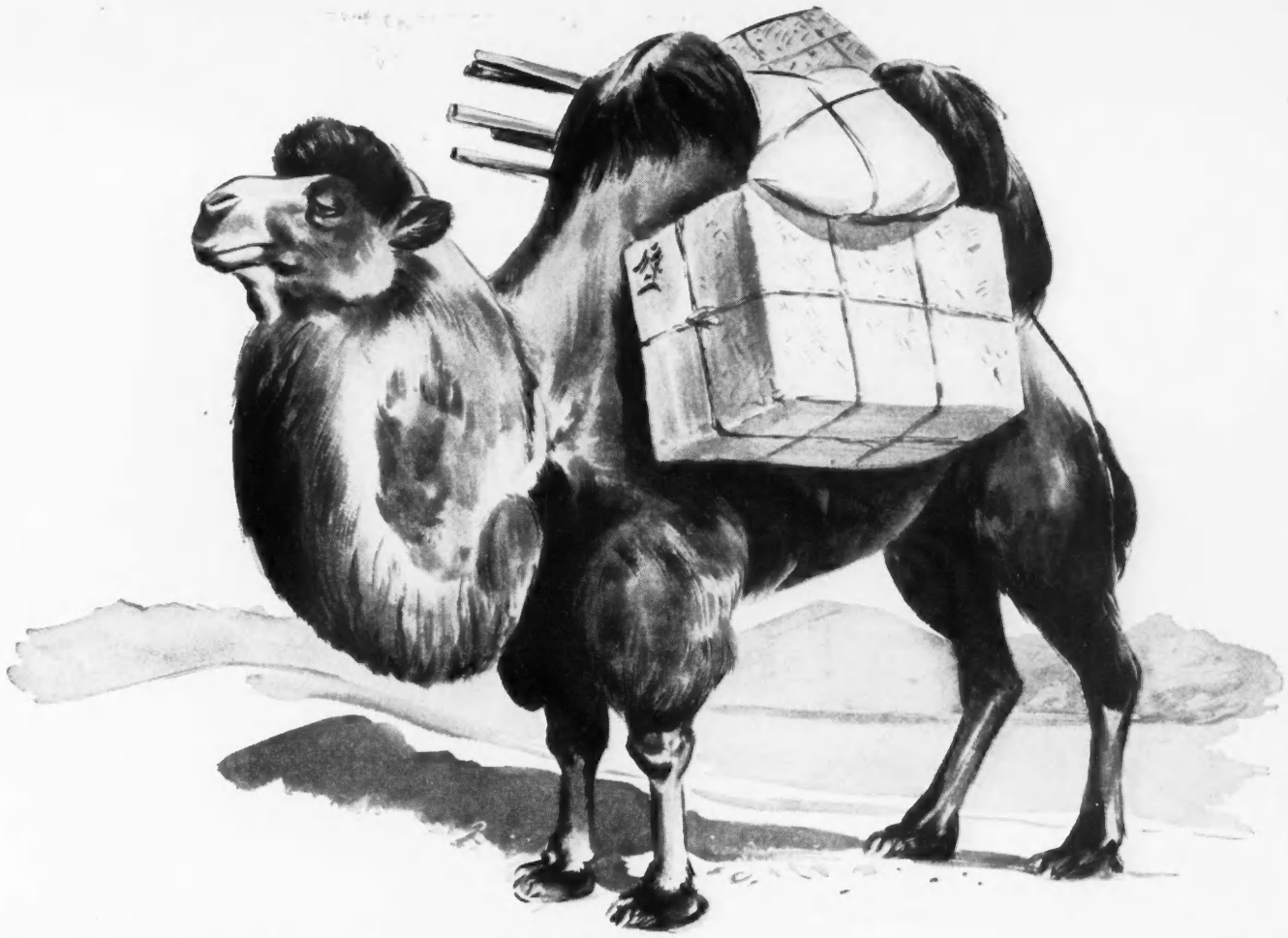
California Independent Telephone Association, Fairmont Hotel, San Francisco, June 10, 11.

Indiana Telephone Association, Claypool Hotel, Indianapolis, June 17, 18.

Washington-Oregon Telephone Associations, Multnomah Hotel, Portland, June 18, 19.

Michigan Independent Telephone Association, Hotel Pantlind, Grand Rapids, Sept. 9, 10.

Alabama-Mississippi Telephone Association, Thomas Jefferson Hotel, Birmingham, Ala., Nov. 8, 9.

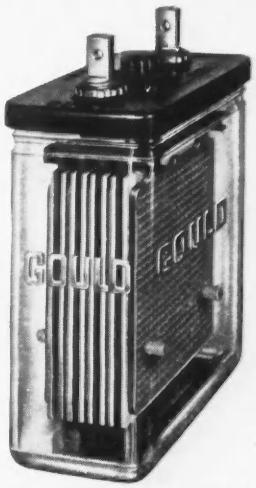


LASTING POWER

for Telephone, Switchgear, Alarm, and Emergency Applications...

THANKS TO BATTERY POWER!

When emergency strikes, you never know how long it will stay with you. That's where the unequalled lasting power of Gould Planté Batteries pays big dividends. The positive plates of these finest stationary batteries available today, are PURE LEAD! They constantly renew active material as the battery floats. Gould Planté Batteries maintain top capacity, provide tremendous reserve power for years after ordinary stationary batteries have to be replaced. It's the lowest cost stand-by power you can buy! *Standardize* on *Planté!*



Specify
GOULD PLANTÉ—
The Aristocrat of
Stationary Batteries

GOULD *INDUSTRIAL BATTERIES*

GOULD-NATIONAL BATTERIES, INC., TRENTON 7, N. J.

Always Use Gould-National Automobile and Truck Batteries

©1953 Gould-National Batteries, Inc.

SAFETY is a part of every job and cannot be separated and handled as something apart.

A Major League Job In Safety

By E. E. WYLAND

Assistant Vice Pres., Personnel,
Mt. States Tel. & Tel. Co., Denver, Colo.

THE SAFETY engineer should have no problem selling any individual a method to protect himself and perhaps actually save his life, but unfortunately the human being must be sold safety and be constantly reminded of that sale. This requires salesmanship and showmanship — presenting the same subject in new stage settings, in new and novel ways — anything, in fact, to keep safety foremost in the person's mind.

In this modern age with television and the many other mediums of information and entertainment competing for a spot in a person's mind and memory, the safety engineer must constantly search for the best and most efficient means to meet this competition.

The Mountain States Telephone & Telegraph Co., which comprises seven states and El Paso County, Texas, has been making an annual safety award for over 30 years to the state with the outstanding performance in this phase of our job. The actual presentation of these awards permits the recognition of an outstanding job, but even more important, it offers still another opportunity to discuss and accent safety, a subject never completed and a project which knows no end.

The program was designed not only to compliment our group, but to impress upon them the tremendous job they were doing in safety and to stimulate, if possible, even greater effort by accenting certain features and drawing conclusions from our past experience.

Occasionally someone asks why we have safety lectures or talks, for such meetings in themselves do not prevent accidents. But any discussion of safety will cause a certain amount of the subject matter to rub off on you. You will take away some good idea which may help you avoid an accident, eliminate a hazard, or assist in selling others on safety measures. Any such discussion will, in any event, serve as a refresher or

review and if it does nothing more than to place accident prevention back in a prominent position in your thinking, it will have accomplished a great deal.

Safety is part of every job and cannot be separated and handled as something apart. Every operation of every assignment must be considered from the safety viewpoint and the operation carried out safely on the job. This is the objective of all safety training.

Meetings are no substitute for safety on the job. They are only valuable from an instructive standpoint and from the stimulus they can give.

A Major League Job in Safety

WHEN WE SAY, "Major League," we think of the ultimate in competition, the big time as it were. Safety certainly is a major league job in every industry in every area.

The communications industry, by accenting accident prevention over the years, has achieved what we feel are major league results in an industry which could be, and once was, so hazardous that special premiums were required for insurance. It now has achieved a safety standard equivalent to that of banks and financial institutions and you can well imagine the physical hazards that exist in a bank. Perhaps there are other hazards, but we are assured that the physical hazards are practically negligible; in fact, the National Safety Council advises that the Bell System has the lowest frequency and severity rate of accidents of any industry reporting to them. This is a testimonial to a safety program carried out over a period of some 30 years. We have received the award of the National Safety Council.

The 1953 Edition of *Accident Facts*, released by the National Safety Council, shows that the communications industry continues to be the safest American industry.

According to this report, the communications industry was five times safer than the average during 1952, having a frequency rate of 1.61 lost time injuries per 1,000,000 manhours as compared to 8.40 for all industry. Its severity rate was more than six times better than the average, being .10 day lost per thousand manhours as compared with a .68 for all industry.

A slogan which has a great deal to do with the success of our safety program represents the creed by which we work and is the safety law by which we are governed:

No job is so important
And no service is so urgent —
That we cannot take time
To perform our work safely.

Pre-Safety Days

THERE WAS a time when this slogan did not exist, a time when horse play was the order of the day and linemen were judged solely on their speed and prided themselves on being able to come down a pole in two or three steps. Sometimes a lineman would be particularly adept and could reach the ground by cutting into the pole only once. Then, occasionally, some linemen would make it down without touching the pole at all and they would carry him off to the hospital as one of the budgeted accidents.

Yes, we do mean budgeted accidents. Those were the days, before our safety program, when supervisors actually estimated the number of accidents they might have on a big job. We are told that many years ago, in one instance, on a particularly hazardous operation, it was estimated that six men would be killed. The supervisor was quite euthused at the completion of the job since there were only two fatalities. Safety has come a long way since that time.

There was a time when a husky lineman would have refused to use iodine on a cut or scratch. He would have been considered a sissy. Today the man who refuses to utilize such treatment is looked down upon by his fellow workers.

In those pre-safety days, every crew had to have a picture taken under the most hazardous conditions possible. Usually the entire crew, and then we utilized big crews, would climb aloft and stand on the crossarms to have a picture taken. If someone failed to stay aloft, he not only was out of the picture, but probably off the job for some time. This is the sort of thing that no one would tolerate in the present safety-conscious era.

"Reward For Safety"

SAFETY IS a personal job. No one can be safe for us but ourselves. Each of us is inherently selfish and invariably our first thought is for ourselves, then for our family and loved ones, and finally we may think of those other people around us.

Occasionally, someone suggests that if they have carried out the safety program so well, why do they not receive a monetary reward? My answer to this is that they have received the greatest possible reward. They have assisted in making their job (which could be, and once was, one of the most hazardous in all industry), one of the safest.

The greatest reward for safety is paid up completely at the close of every safe day. A special monetary reward under such conditions is equivalent to saying: "If I do my work today, and don't kill or maim myself, will you give me a special reward?" A company can provide the best tools known, the best and most complete training possible, but in the final analysis we must be safe for ourselves.

One of the greatest safety factors is habit. Training ourselves in habits of doing the right instead of the wrong thing.

You can't have two types of table manners, one for home and one for company, any more than you can have two types of safety manners, one that applies when the supervisor is around and another when you are working by yourself; one when you are driving and see the officer of the law in the rear vision mirror and another when you don't see him there.

Making a habit of performing our work the correct and safe way is one of the most important assets to accident prevention. Ask the young lady at the typewriter why she strikes a certain key with a certain finger. She has developed the habit of striking that key. She has taught herself to do the right thing by habit and she can do this almost without thinking. That's why correct habit is so important in accident prevention. When hazardous situations arise that demand split second decisions, if we automatically do the right thing by habit, apply the brakes, etc., we have a better chance for safety.

When we fall below par (the times that our mind may be dulled), doing the correct thing by habit may pay off and prevent an accident.

Safety programs must be sound and practical. I feel that we are occasionally misguided and that we have a sense of security and

accomplishment by holding meetings and placing posters on bulletin boards when, in fact, we are riding the merry-go-round. We're always on the go, round and round, but we're not getting anywhere. Actually it has been my experience that if you want to hide something, put it on the bulletin board.

We made an actual survey on this point. In a fairly large room with some 40 to 50 clerks and management employes, the bulletin board was located in a most prominent position. By actual poll we found that no one knew what was on the bulletin board. When we asked the chief clerk, who placed the items on the bulletin board, he said he was sure there was a safety poster. However, he actually referred to the poster which had been up the month before rather than the current one. He was sure there was a safety bulletin on the board because there was always one there.

We placed a large sign in a garage and for the first two weeks everyone knew what the safety sign said. We changed the wording. Only a few noted it. We changed it again and no one noticed. We placed a safety poster on a standard by the door where the trucks had to halt before driving out. The first week everyone knew the content. The next change, a few knew the content, and the third change literally no one noticed.

And what does all this add up to? Just one thing. You must vary your approach, vary your incentive, change the appearance to attract attention. Safety is a sales job, a promotion job and it takes good showmanship.

"When the Blizzards Blow"

WE, IN THE Mountain States company, serve one-quarter of the United States, 24.5 per cent to be exact. Our territory runs from the Canadian border in the north to the Mexican border in the south, serving Montana, Idaho, Wyoming, Utah, Colorado, New Mexico, Arizona and El Paso County, Texas. The precipitous, rugged and beautiful Rocky Mountains traverse this area from the Canadian border on down to the southland. We serve the highest incorporated city in the United States, Leadville, 10,200 feet above sea level. The low point in our area is at Somerton, Arizona, 300 feet above sea level. We experience every condition from the problems of the high mountain passes to those of the plains and desert.

WHEN THE BLIZZARDS blow, man must call upon the maximum of his ingenuity to meet conditions.

Most of our lines of communication, the transcontinental highways, the railroads and our own telephone lines must cross precipitous mountain ranges through high mountain passes, such as Togwotee Pass in Wyoming and Elwood Pass in Colorado. Here we have located shelter cabins short distances apart as protection for our winter toll patrols against the days when the storms bring their fury down upon us — conditions that make this one of the real Major League Areas in Safety.

Most of us are familiar with the telephone truck and the workmen that we see on the sunshiny days. That is because about the only time we are out and about is in that type of weather. But when we are snug at home before the big fire while the storm rages outside, the telephone man is out on the mountain passes, out on the blizzard swept plains, repairing storm damage and living up to the tradition that the call must go through.

Yes, when the blizzards blow, that's when the transportation problems become more difficult and where man must call upon the maximum of his ingenuity to meet conditions.

As in the earlier days, we still find the pack train valuable in moving our supplies to the storm breaks and always we must fall back on the old reliable snowshoe and ski.

Occasionally, it becomes necessary, due to the terrain and the difficulty of transport, for the men to pull the supplies on a toboggan.

Dog teams enable us to get circuits back in service when the mechanical marvels of our modern age meet obstacles which they cannot overcome.

Some of the most modern of the snow vehicles are expensive tools when you consider that they are used for only a few trips a year. But what important trips they turn out to be! Three men with a snow buggy were awarded Vail Medals for their heroism in rescuing a number of people near Cheyenne, Wyoming, in the blizzards in January of 1949.

The snow toboggan works ideally in the type of snow around Rexburg and St. Anthony, Idaho, west of Yellowstone National Park. In the Jackson Hole country south of Yellowstone Park, a snow plane meets the situation.

The power horse and prime mover

of the snow vehicles, however, is the sturdy Tucker "Snow Cat." But in the storms of the past winter, it, like the other vehicles, found the going far too tough and so we had to rely on the dog teams and revert to snowshoes again.

During the winter of 1951-52, one of the most severe and difficult ever experienced on the Western Slope of the Rocky Mountains and over many parts of the Nation, even more stories further justified this as "A Major League Area in Safety." Unheard of depths of snow, which on Cumbers Pass reached some 41 feet, where the D. and R.G. Railroad had four trains with five engines and 47 crew men marooned for weeks. Some 12 to 13 miles of our toll line were totally buried here. We were able to establish communication with the little town of Cumbers by point-to-point radio.

Further north in Colorado, Wolf Creek Pass, where several individuals lost their lives in slides, the snow depth at some points was over 50 feet and slightly further north, at Elwood Pass, nearly 12,000 feet in elevation, our Alamosa-Durango toll lead was out of service for over two months. The hazards were too great to risk the lives of our men in the restoration of this lead, where even an aerial survey could not be made for over a week, where one of our older type snow vehicles was buried in the snow and where deep drifts made it impossible for even the most modern and powerful snow vehicle to work.

Columnist Marranzino wrote in the *Rocky Mountain News* February 29, 1952: "It used to be in this country that every explorer, pioneer and soldier of fortune was a Kurt Carlsen battling the elements for survival. But we have gone mushy and soft from the pampered lives we lead.

"I think it is about time that the state pays tribute to the men and women in public service who have gone through one of the worst mountain winters in state history without a whimper.

"I salute the men of the Mountain States Telephone & Telegraph Co., the Public Service Company, the REA people, the Colorado Central Power, the Rio Grande and Colorado and Southern employes who have been carrying the fight against King Winter.

"Between Alamosa and Pagosa Springs is a killer pass called Elwood. It wanders up and over the Divide at 11,776 feet by way of an old burro and game trail — now flanked by the talking wire and the telephone pole.

"Sometime in December, the heavy snowfall made matchsticks out of the telephone poles and strands out of the telephone cable.

"Repairmen, crusading against the wintry assault, have been hard at the work for months. They live in tiny shelters dotting the course of the line over the Pass and for weeks are at the mercy of nature.

"But these hardy people are not the ones to yell for help. They don't scurry for the Red Cross, they don't ask the Air Force to drop them food and supplies, they don't get governmental relief. They just carry on as if the snow they live in is good only for winter sports."

SAFETY CHARTS do not make us safe. It's the attitude inside the employe which creates safety.

These are unusual conditions, tremendously trying conditions for those men in the utility industries who are forced to fight the elements, but they demonstrate the most important safety lesson of all, that regardless of the conditions, when one is conscious of the hazards and thinking of safety, no accidents will result and in this most severe winter of our times and in spite of the tremendous hazzards, no accidents resulted. A proof that safety programs and safety consciousness pay off.

There is a book which should be the book of the century, at least to those of us in the communications industry where the tradition of service is so important. That book is titled, "For Noteworthy Public Service." Between its covers are the case histories of individuals who, when storms bore down upon us, when streams swollen by flood waters inundated our lands and villages, during fires or other emergencies, rose above the normal call of duty.

These stories make your blood tingle, give you a thrill and a surge of tremendous pride. For the most part, these are stories of heroism during emergencies in storms.

"80,000 *Drivers*, 60,000 *Vehicles*"

TO CARRY ON the System's communications work requires 80,000 drivers and 60,000 vehicles; last year the Bell System fleet of motor vehicles was driven roughly over 600 million miles. If this fleet of cars were to leave New York City via one of the major transcontinental highways, the first vehicle would have

Please Turn To Page 80

Power and Level In Carrier Systems

By G. D. WALLENSTEIN

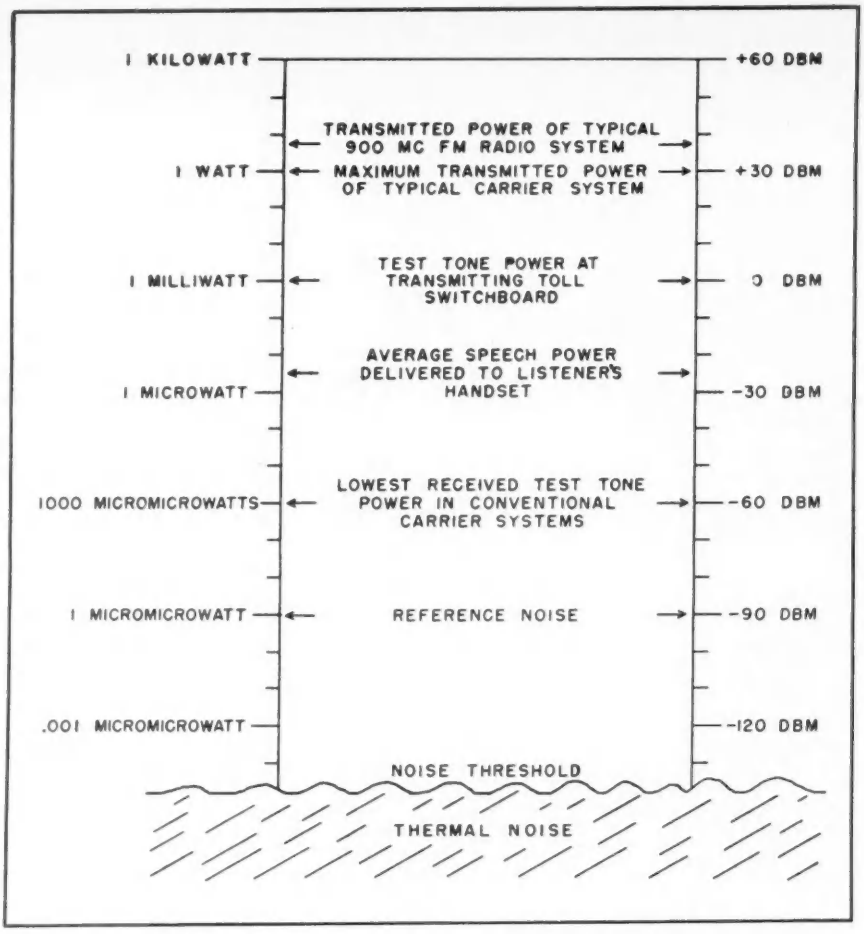


FIGURE ONE: — Range of powers of interest in telephony.

Section III of TELEPHONE ENGINEER & MANAGEMENT's series on carrier discusses — (1) yardsticks of speech and carrier transmission; (2) carrier transmission levels; (3) carrier power level; (4) test tone power, and (5) constant in carrier systems. Section I of this series appeared in the Powers in carrier systems. Section 1 of this series appeared in the Dec. Telephone Engineer & Management. Section II was published in the January issue.

IN THE EARLY days of telephony, the physical strength of the human voice had to generate the power required to bridge the distance between talker and listener. Transmission performance depended mainly on the quality of the subscriber instruments at both ends, on the length and type of interconnecting wire line and on the weather. A connection was satisfactory when the talker's voice "got through." There was little value in quantitatively knowing the speech power or the amount of connecting losses.

Since the advent of vacuum tube amplifiers, telephone circuits have been able to furnish their own auxiliary power to speech at talker's and listener's ends and at intermediate points as required. While this has vastly increased the usefulness of the telephone system, it has also made it necessary for telephone people to know much more about the power involved in speech transmission and the gains and losses contributed by various types of circuits.

Practical limits to the possible length of modern telephone connections are set by the maximum power that can be economically transmitted and the minimum receiving power required to assure intelligibility over noise.

While many voice circuits operate to this day without the use of amplifiers, carrier systems include amplifiers as basically as they use oscillators and electrical wave filters. Internal power loss associated with the process of modulation, coupled with the phenomenon of increased line losses at carrier frequencies, makes amplification a must for all carrier systems. Carrier systems are thus inherently provided with the means for arbitrarily raising and lowering the power of electrical currents which contain the spoken intelligence. In practice, powers used in carrier systems are very much a function of economy, technical convenience and convention.

Yardsticks Of Speech And Carrier Transmission

THE UNIT of power used in all electrical work is the watt. Since the powers used in telephony are very much smaller than those occurring in electrical lighting and power,

**Mr. Wallenstein is chief applications engineer of the Lenkurt Electric Co., Inc., San Carlos, Calif.*

one-thousandth of one watt — 1 milliwatt (1 mw) — is the common reference unit in telephone work. Typical power values of interest in telephony are shown in *Figure* 1.

Over a typical length of line connecting two carrier terminals, the carrier current power may be reduced to the order of one-millionth of one milliwatt. Amplifiers may be provided at the carrier terminals and repeaters, capable of raising such low powers by as much as 1,000,000 to 1, or back to the order of a milliwatt. The carrier equipment will also include devices such as band-restricting filters through which the speech power may pass at a loss of only 5 percent of its power. To adequately compute both very large and very small ratios of power, logarithmic units are used rather than fractions of milliwatts. The accepted logarithmic unit for power ratios is the decibel (db). An amplifier delivering 10 times the input power at its output is said to have a gain of 10 db. A network reducing power applied to one-half the original value has a loss of 3 db. Typical db values for ratios are tabulated in *Figure* 2.

Successive amounts of db gain and db loss in a circuit may be added algebraically to find the net gain or loss between two points.

DECIBELS	APPROXIMATE POWER RATIOS		
	LOSSES		GAINS
	FRACTIONAL	DECIMAL	DECIMAL
0	1	1.0	1.0
1	4/5	.8	1.25
2	2/3	.63	1.6
3	1/2	.5	2.0
4	2/5	.4	2.5
5	1/3	.32	3.2
6	1/4	.25	4.0
7	1/5	.2	5.0
8	1/6	.16	6.0
9	1/8	.125	8.0
10	1/10	.1	10.0
20	1/100	.01	100.0
30	1/1000	.001	1,000.0
40	1/10,000	.0001	10,000.0
50	1/100,000	.00001	100,000.0
60	1/1,000,000	.000001	1,000,000.0

THE "DB" ALWAYS REPRESENTS A FIXED PERCENTAGE REDUCTION OR GAIN IN POWER, NO MATTER WHAT FREQUENCY IS INVOLVED.

FIGURE TWO: — Relation between decibels and power ratios for various gains and losses.

Carrier Transmission Levels

THE POWER generated by talking into a microphone varies considerably with such factors as the strength of the talker's voice, his distance from the microphone, the distribution of frequencies contained in the speech, and the relative efficiency of the microphone. Despite these wide-range variables, it is possible to determine carrier system transmission power in relation to speech and so set the basic operating conditions. This is accomplished by the concept of transmission *level.*

Level is generally defined as a relative indication of the magnitude of some quantity. In telephone terminology, the term transmission level (usually referred to only as level) indicates the amount of gain or loss between a circuit point and a zero reference point which is always the transmitting toll switchboard.

As illustrated in *Figure* 3, a carrier system connection may be represented as a chain of devices having either gain or loss. At the point of connection between any two devices the level of transmission will appear raised (gain) or lowered (loss) as compared to the preceding check point.

If the gains and losses are consistently measured in terms of the same units, it is possible to add their numerical values, giving positive (+) sign to gains and negative (—) to losses. The net sum obtained between the carrier terminal's points of connection to the switchboard and to the carrier-frequency line respectively represents the transmission branch gain. For convenience, the start of transmission at the switchboard is considered (0) zero level.

Thus a carrier system transmitting at +17 db level to the line in effect introduces 17 db of gain between the switchboard and the line.

Rated transmission levels give a convenient description of a given system's ability to coordinate with other systems on the same facility as well as with office test and switchboard standards. Such a standard is commonly used for most four-wire voice frequency connections, where a transmission level of —16 db (formerly —13 db) must be accommodated at carrier terminal transmitting input and a level of +7 db (formerly +4 db) be available at the terminal receiving output.

In a typical carrier terminal, a total of 16 + 17 = 33 db net transmitting branch gain must be provided if the transmitting line level is to be +17 db.

Carrier Power Level

NOT ALL the important characteristics of a carrier system are adequately described by the transmission levels alone. Electronic circuits

have definite limits of power handling capacity. Unless the equipment has been designed to perform satisfactorily under a known maximum power load condition, severe distortion of transmission may result.

On the other hand, unnecessary reserves of power handling would increase the cost, size, supply power drain and maintenance of the equipment. Many years of study conducted on speech circuits have yielded rather accurate estimates for talker volume as available at the switchboard.

From such studies a power of 1 milliwatt has been recognized as the typical switchboard maximum. This led to the adoption of the standard reference *Power Level of* 0 *dbm* (*one* milliwatt at 0 *db level point*). It is then possible to say that a typical carrier system will transmit a +17 dbm power level at the +17 db transmission level point in one channel under maximum talker volume conditions.

Test Tone Power

THE NUMERICAL identity between conventional transmission and power levels has particular merits in the lineup and maintenance of carrier equipment installations. A test tone of 0 dbm power is used at the carrier channel 0 db level point representing a steady channel load. The tracing of this test tone through the various check points of a carrier system allows verification of transmission levels as well as performance tests under load. Typical carrier terminal input and output test tone powers are shown in *Figure* 4.

This identity of power and transmission levels is not applicable to carrier systems equipped with compandors. This is due to the fact that the compandor is a variable-gain device controlled by the power passing through it. Use of the conventional test tone technique is possible without confusion in systems where the compandor is applied in such a manner that it can be easily taken out of the circuit under test.

Constant Powers In Carrier Systems

IN CONVENTIONAL single-sideband type carrier systems, the carrier current power transmitted to the line is directly related to the speech power level at the switchboard. No power is transmitted during idle intervals. In such systems, the only steady-state carrier power encountered — except when the external test tone is used — is that of the carrier oscillator frequency used for modulation. This frequency is not transmitted over the line.

Author, G. D. WALLENSTEIN is chief applications engineer of the Lenkurt Electric Co., Inc., San Carlos, Calif.

Many modern carrier systems include signaling facilities which employ constant-tone type transmission. Unlike speech, these tones are transmitted at fixed power levels, usually so selected that their load and crosstalk effect is comparable to the median talker load. In addition, pilot frequencies having the character of constant tones are often used for automatic regulation and system supervision. The carrier current power present on the line is then composed of a minimum steady-state load with additional single sideband power varying as speech is transmitted over the channels.

In the 45A twelve-channel carrier system, for example, the total minimum transmitting load is about +13 dbm or four db below one channel test tone power.

In some double-sideband carrier systems, the channel carrier modulating frequency is also transmitted at a steady power level considerably higher than test tone sideband power. To detect the presence of test tone transmission in such equipment requires the aid of frequency-selective instruments. The system load is almost entirely determined by constant-tone type transmission which does not contain useful intelligence.

In multi-channel radio systems using the frequency-modulation principle, the radiated transmitter power is a constant regardless of speech load. In radio system layout work the constant power level ratings of transmitter and receiver and the losses between them are used in the same way as the per-channel transmission level and line loss figures of wire-line and cable systems.

Transmission Level Maintenance

WHETHER OR not a particular carrier system uses essentially single-sideband or constant-tone type power over the carrier-frequency line, the ultimate objective is reproduction of speech power at the far listener's end. This speech is not a constant;

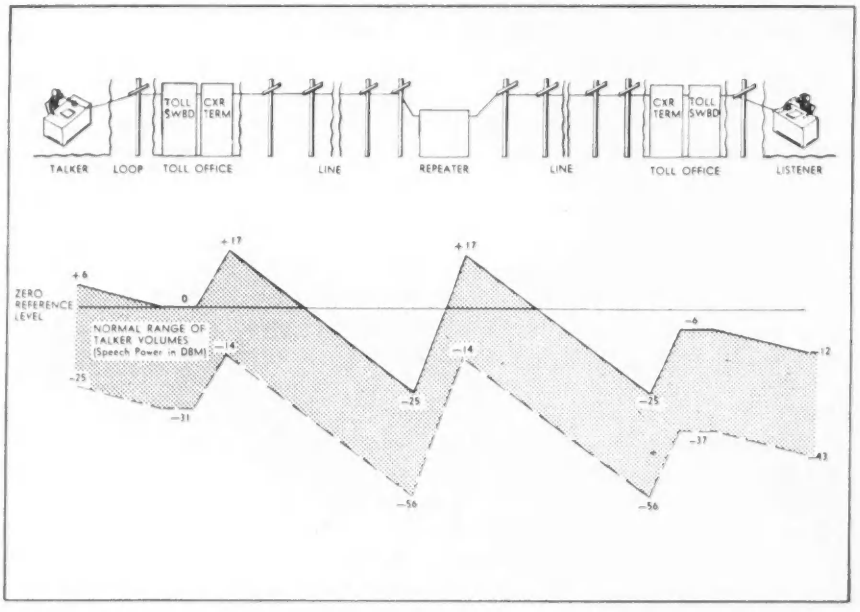


FIGURE THREE: — A level diagram showing the relative strength of transmitted signals at various points in a typical toll circuit. Normal range of talker volumes is also indicated.

When Life's at Stake Rely on...

KLEIN

Show the familiar Klein trademark to the old-timer on the pole and he'll tell you—"that's the equipment I've been using ever since I was a grunt."

Yes, workmen just naturally feel safer when the equipment is Klein—recognized for quality "Since 1857."

ASK YOUR SUPPLIER

Foreign Distributor: International Standard Electric Corp., New York.

Write for your free copy of the Klein Pocket Tool Guide today!

Since 1857

Mathias KLEIN & Sons

Established 1857 — Chicago, Ill., U.S.A.

3200 BELMONT AVE., CHICAGO 18, ILL.

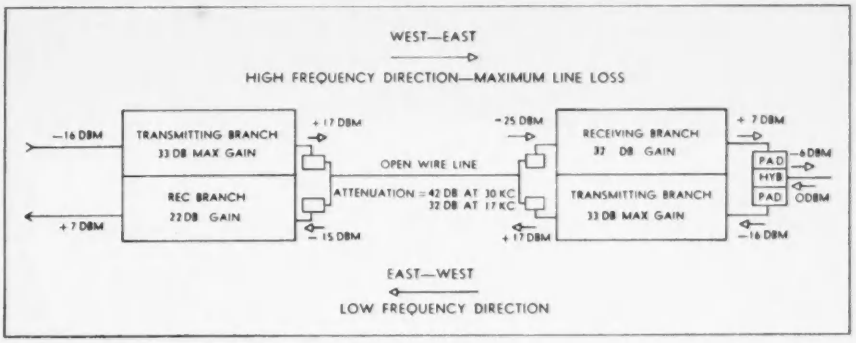


FIGURE FOUR: — Simplified block diagram of a two-wire carrier system illustrating typical test tone power levels at the connections to the carrier equipment.

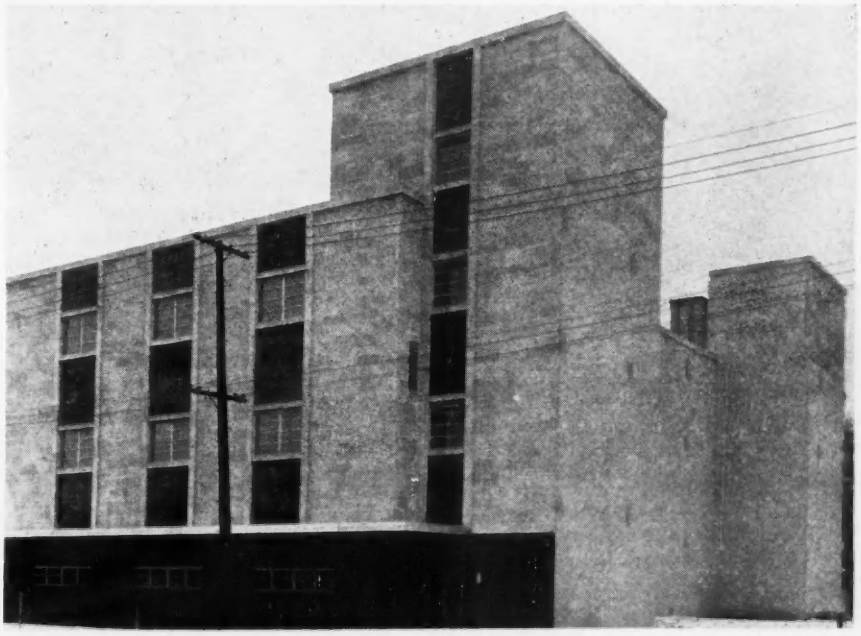
it relies for faithful and audible reproduction on a wide-open highway capable of carrying all the variables present in the speech. A well-designed carrier system provides such a facility, with transmission levels laid out so that the listener is assured reasonably equal quality and loudness under all normal operating conditions.

Many modern carrier systems such as Western Electric Type 0 and Lenkurt Type 45A include automatic regulating devices to maintain levels within close tolerances. In such systems only occasional test tone transmission is needed to verify that the standard levels are being maintained, rain or shine.

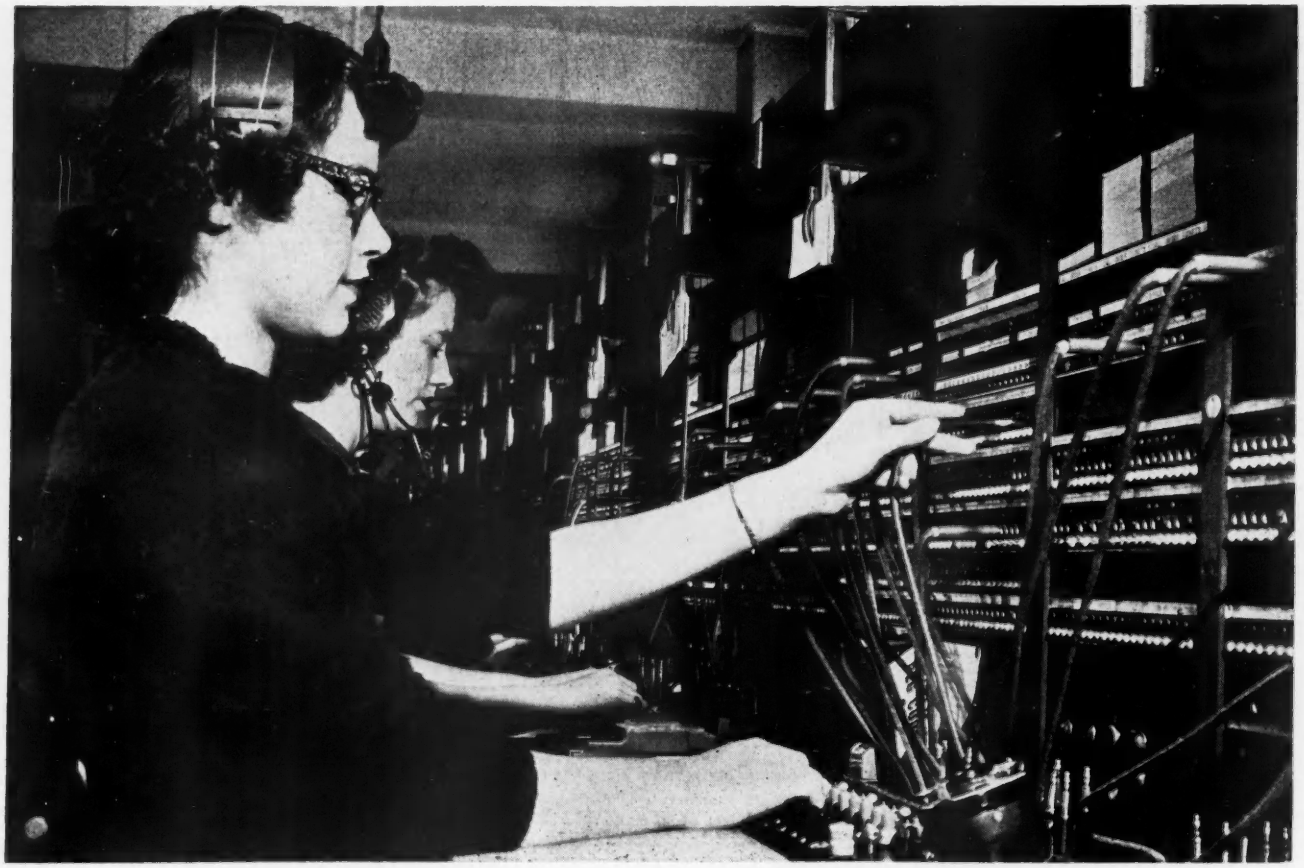
If it is considered that average speech power delivered to the typical listener's handset may be on the order of 2 microwatts, it may appear pedantic to speak of level regulation within 1 db (This is equivalent to specifying that a nominal received speech power of 2 microwatts will actually vary between 1.8 and 2.2 microwatts.)

However, many connections are established by patching several circuits together; at a cumulative level variance of 3 db, for example, the received power would be either one-half or twice that of norminal. Levels higher than nominal are no more desirable than lower ones, as all conventional telephone circuits can be made unusable by a singing condition — the excessive return of energy from the receiving to the transmitting path.

With growing interdependence between telephone circuits in a nationwide toll plan, coordination of transmission levels and powers is a must. A clear understanding of the meaning of these terms may be a prerequisite to making coordination work. — THE END.



Equipment in LT&T's new telephone building at 15th and M Streets, Lincoln, is the hub of the operator long distance dialing system for 125 cities in southeast Nebraska. Together, the building and equipment cost well over $3,000,000. The building now contains equipment and service personnel only.



A LARGE PART of the work of managing the traffic department centers around the provision of an adequate operating force. The grade of service given is closely related to the operating force as is the control of the cost of supplying the service.

Measuring and Scheduling Traffic Work Time

By RUTH E. RICHARDS
Methods Supervisor
General Telephone Co. of Ill.
Springfield, Ill.

For informed management the day of "by-guess" provision of force in the traffic department has vanished. Traffic now has its standard measurement — the traffic unit and calls offered can be translated into work time by the application of a weighted coefficient.

ONCE UPON a time — so the story goes — someone asked a Southern mammy for her "receipt" for a particularly delectable dish. Delighted, she proceeded to relate the process: — "*Well, chile, ya take a lump of butter 'n puts it into your flour, then you adds two 'glubs' of molasses, etc.*"

Yes, two "glubs." Strangely enough a "glub" was a form of measure. It meant the amount of molasses that would pour from a jug before the jug would become air-locked and stop the flow of the thick liquid. The days of by guess and "by-golly" cookery are a thing of the past, replaced by today's splendid tested receipes and standard measurements.

So too, are gone the days of "by guess" provision of force in the traffic department for informed and cost conscious management. Traffic now has its standard measurement, the traffic unit, and through the use of

this system of measurement, calls offered can be translated into work time by the application of a weighted coefficient.

Telephone engineers after intensive studies have determined the amount of operator work time required for all phases of an operator's work. Operator work time is expressed in units, and each unit represents 15.65 seconds of work time (based upon the approximate work time required to complete a local to local common battery call with manual ringing). Standard coefficients as applied to peg counts, represent the length of time allotted to the handling of different kinds of calls expressed in terms of units. Thus, a coefficient of 1.25 which is applied to magneto calls, represents 15.65 seconds x 1.25 or 19.56 seconds of work time.

As there are 3600 seconds in an hour, 15.65 seconds divided into 3600 seconds gives us our basic busy hour load per operator (or her position) of 230 units. It is contemplated that an operator of average ability working at a pace which she can maintain without undue fatigue can handle 230 units per hour when working as one of a team. The number of operators in the team and the spread of traffic over the board affects the load carrying capacity of the force. Fewer units per operator hour will be carried as team size decreases.

With Single Answering Jacks							Two or More Appearances of Answering Jacks						
Units Per		Number of Working Positions					Units Per		Number of Working Positions				
		1	3	5	7	9			1	3	5	7	9
Half Hour	Hour	2	4	6	8	10	Half Hour	Hour	2	4	6	8	10
		Position Hours Required							Position Hours Required				
50	100	1.0	1.1	1.3	1.5	1.6	50	100	1.0	1.0	1.1	1.2	1.3
100	200	1.4	1.5	1.7	2.0	2.2	100	200	1.4	1.4	1.5	1.7	1.8
150	300	1.8	1.9	2.1	2.4	2.7	150	300	1.8	1.8	2.0	2.1	2.3
200	400		2.3	2.5	2.8	3.1	200	400		2.2	2.4	2.6	2.7
250	500		2.6	2.8	3.1	3.5	250	500		2.6	2.8	3.0	3.2
300	600		3.1	3.2	3.5	3.8	300	600		3.1	3.2	3.4	3.6
350	700		3.5	3.6	3.9	4.2	350	700		3.5	3.6	3.8	4.0
400	800		3.9	4.0	4.2	4.5	400	800		3.8	3.9	4.2	4.4
450	900			4.3	4.6	4.9	450	900			4.3	4.6	4.8
500	1000			4.7	5.0	5.3	500	1000			4.7	5.0	5.2
550	1100			5.1	5.4	5.6	550	1100			5.1	5.4	5.6
600	1200			5.5	5.7	6.0	600	1200			5.5	5.7	6.0
650	1300			5.9	6.1	6.4	650	1300			5.9	6.1	6.3
700	1400				6.4	6.7	700	1400				6.5	6.7
750	1500				6.8	7.1	750	1500				6.8	7.1
800	1600				7.2	7.5	800	1600				7.3	7.5
850	1700				7.6	7.8	850	1700				7.7	7.9
900	1800				8.0	8.2	900	1800				8.0	8.2
950	1900					8.6	950	1900					8.6
1000	2000					9.1	1000	2000					9.1
1050	2100					9.4	1050	2100					9.5
1100	2200					9.8	1100	2200					9.8

Table of Required Position Hours
Toll Board or Magneto Local

Note: Number of Positions Does Not Enter Into Calculation of Requirements

Units Per			Units Per		
Hour	Half Hour	Position Hours	Hour	Half Hour	Position Hours
50	25	.7	550	275	2.7
100	50	.9	600	300	2.9
150	75	1.1	650	325	3.1
200	100	1.3	700	350	3.3
250	125	1.5	750	375	3.5
300	150	1.7	800	400	3.7
350	175	1.9	850	425	3.9
400	200	2.1	900	450	4.1
450	225	2.3	950	475	4.3
500	250	2.5	1000	500	4.5

For Greater Number of Units Increase Opr. Req. .2 For Each 50 Units Per hour.

EXAMPLE ONE: — Theoretical position hours required local common battery board.

Force Provision

A LARGE PART of the work of managing the traffic department of an exchange centers around the provision of an adequate operating force. The grade of service given is related very closely to the operating force as is the control of the cost of supplying the service. Too few operators provided will affect service adversely; too many will affect operating costs the same way.

Accurate records of traffic are essential. Peg counts which have been equated to provide coefficients for the individual office, and hourly counts of traffic offered are the basis for an operator's schedule of hours. For those offices where traffic varies sharply from season to season, a schedule based upon the average traffic for the period to be covered provides the most satisfactory service. When the volume of traffic offered is relatively steady, a basic schedule with supplementary tricks to be added as traffic increases or dropped as it declines, is generally satisfactory.

Where the volume of traffic offered is approximately the same from month to month, the numbers of calls offered each hour (distribution) will generally not vary to the extent that major schedule changes will be required. The spring and summertime calling habits of customers will be different from fall and winter calling habits and may affect your early morning and late evening requirements. To cover such changes in traffic volumes, the adjusting of one operating trick will often cover the need. An early morning trick advanced one half hour or an evening trick extended one half hour may be all that is necessary to care for the increased number of calls offered. It is generally true, especially of early and late traffic that the greatest portion of an hourly increase in traffic will be found to occur in one half of the hour.

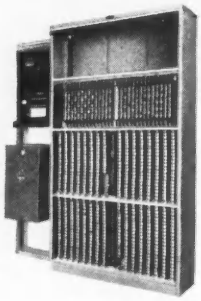
In preparing an operator's schedule the hourly distribution of traffic should be representative of the period to be covered.

The examples shown in this article are intended as guides for providing operating tricks to cover traffic offered. It should be recognized that each exchange must be considered individually for such factors as equipment conditions and the experience of the force.

Portions of standard tables for "Theoretical Position Hours Required," are shown as *Example One*. It is presumed that where requirements are greater than those covered by these tables that source material other than provided by this article should be used.

Hourly Requirements, Example Two

THE HOURLY force requirements should be computed from the most recent counts. For determining local requirements use the count of flat rate calls. For determining sep-

An idea...  that is still growing!

1948 1949 1950 19

LEICH DIAL SWITCHBOARDS ARE INSTALLED OR ARE BEING BUILT FOR THE FOLLOWING EXCHANGES:

ALABAMA
Goshen
Lapine
Pine Level
Ramer
Thorsby

ARIZONA
Chinle
Ganado
Keams Canyon
Tuba City

ARKANSAS
Lake City

COLORADO
Blanca

FLORIDA
Crawfordville
Greenville

GEORGIA
Broxton
Coolidge

IDAHO
Potlatch
Priest River
St. Maries

ILLINOIS
Argenta
Armington
Atlanta
Ava
Biggsville
Brimfield
Brookville
Buckley
Buda
Cabery
Camp Grove
Campus
Carrier Mills
Castleton
Cedarville
Chadwick
Chatham
Cherry Valley
Cisco
Clay City
Coleta
Compton
Coulterville
Creal Springs
De Soto
Edelstein
Elkhart
Elkville-Dowell
Ellis Grove
Elwin
Emmington
Ewing
Goreville
Henning
Joy
Kirkwood
La Place
La Rose

ILLINOIS (Cont.)
Lima
Loda
Loraine
Magnolia
Marissa
Mendon
Meyer
Milton
Neponset
New Douglas
New Holland
Palmyra
Pawnee
Perry
Pleasant Hill
Roscoe
Rose Hill
Saybrook
Sheridan
Sidney
Somonauk
Stillman Valley
Stonefort
Thompsonville
Tilden
Ursa
Warrensburg
Wayne City
Willow Hill
Winnebago
Wonder Lake
Woodlawn
Yale
*Galesburg (4)
*Herrin
*Lincoln
*Mendota
*Ordill
*Robinson

INDIANA
Akron
Brownsville
Burket
Crothersville
Dunlap
Fritchton
Frankton
Galveston
Hamilton
Hanna
Hanover
Kouts
La Crosse
Laketon
Mays
Mechanicsburg
Medora
Millhousen
North Madison
Perkinsville
Pleasant Lake
Raleigh
St. Joe
Spurgeon
Vallonia
Wheatland
Young America
*Connersville—(2)
*Lafayette—(3)
*Logansport
*La Porte
*Valparaiso

IOWA
Argyle
Atkins
Batavia
Bayard
Bennett
Denmark
Emeline-Iron Hill
Hartwick
Hillsboro
Ionia
Le Clair
Lisbon
Lowden
Marble Rock
Montrose
Oxford Junction
Primrose
Ventura

KANSAS
Dexter
Tribune

KENTUCKY
Bryantsville
Dover
Fernleaf
Grayson
Lewisburg
Liberty
Mays Lick
Olive Hill
Owingsville
Pine Knot
Sharpsburg
Washington
Wilmore
*Lexington—(2)

LOUISIANA
Belcher
Gilliam
Hosston
Ida

MICHIGAN
Avoca
Bath
Burr Oak
Laingsburg
New Lothrop
Rankin
Smiths Creek
Twin Lake
White Pine
*Erie
*Harbor Beach
*Milford
*Muskegon—(3)
*Muskegon Hts.
*Sturgis
*White Pine

MINNESOTA
Alvarado
Argyle
Big Falls
Clarks Grove
Foreston
Gilman
Glyndon
Herman
Kandiyohi

MINNESOTA (Cont.)
Kennedy
Lerdal
Little Fork
Ramey
Rice
Stephen
Woodstock

MISSOURI
Holland

MONTANA
Dagmar
East Froid
Frazer
Larslan
Mouat
Outlook
North Brockton
North of Glasgow
North Hinsdale
North Nashua
Peerless
Reserve
Southeast Lustre
South Flaxville
South Glentana
Westby
West Scobey

NEBRASKA
Arcadia
Arthur
Broadwater
Chambers
Comstock
Dunning
Elsie
Ft. Calhoun
Funk
Kennard
Lewellen
Shelton
Venango
Wynot

NEW JERSEY
Andover
Branchville
Franklin
Hamburg
Ogdensburg

NEW MEXICO
Crown Point
Loving
Shiprock
*Carlsbad

NEW YORK
Luzerne
North Creek
Prattsburg
Pulteney
Urbana

NORTH CAROLINA
Angier
Carthage
Gibsonville
Roaring Gap
Robbins

NORTH DAKOTA
Alamo
Columbus
Epping
Fortuna
Marmon
McGregor
Neche
Ray
Round Prairie
Southwest Ambrose
Stanton
Tower
Wildrose

OHIO
Apple Creek
Bascom
Beaver
Belmore
Berlin
Bristolville
Cairo
Catawba
Cooperdale
Decatur
Dunkirk
East Rochester
Fredericksburg
Gambier
Geneva-on-the-Lake
Glouster
Hanoverton
Harpersfield
Harpster
Holgate
Homeworth
Idaho
Jenera
Johnsville
Laura
Letart Falls
Marshallville
Mason
North Benton
North Georgetown
Paris
Piketon
Racine
Rawson
Resaca
Russells Point
Shreve
Smithville
Stryker
Warsaw
Waterville
Waynesfield
Westminster
Wharton
Winona
Woodstock
*Apple Creek
*Bellefontaine
*Bettsville
*Bryan
*Bucyrus—(3)
*Lima—(11)
*Marion—(6)
*Mt. Vernon
*Ottawa
*Shelby—(2)
*Vanwert
*Wooster

OKLAHOMA
Supply

SOUTH CAROLINA
Branchville
Ehrhardt
Estill
Fairfax
Hampton
Jefferson
McClellanville
Pageland
Ridgeland

SOUTH DAKOTA
Estelline

TEXAS
Arcola
Avinger
Benjamin
Blooming Grove
Charlotte
Claude
Dodson
Earth
Elbert
Eliasville
Estelline
Friona
Gregory
Groom
Happy
Hurlwood
Jourdanton
Knox City
Louise
Loving
Lyford
Meadow
Miami
Mobeetie
Mont Belview
Morton
Nixon
Orange Grove
Petersburg
Portland
Roma
Ropesville
Rosharon
Seadrift
Shallowater
Shepherd
Smiley
Smyer
South Olney
Stafford
Sudan
Wheeler
Whiteface
Woodson
*Seadrift

UTAH
Castle Dale
Cleveland
Emery
Ferron

VIRGINIA
Rustburg

WASHINGTON
Chewelah
Farmington
Granite Falls
Hunters
Kettle Falls
Medical Lake
Palouse
Reardon
Rosalia
Valley
*Medical Lake

WISCONSIN
Barnes
Belgium
Bonduel
Brooks
Brule
Cable
Campbellsport
Cascade
Crivitz
Dalton
Dane
Endeavor
Fifield
Fox Creek
Goodman
Grandview
Herbster
Holman
Jim Falls
Kingston
Lac Du Flambeau
Lake Namekagon
Larsen
Lyndon Station
Marengo
Mason
Mishicot
North Prairie
Oxford
Pembine
Pickett
Port Wing
Reedsville
Saukville
Sayner
Tripp
Twin Lakes
Waino Oulu
Wausaukee
Whitelaw

WYOMING
Freedom
La Grange
Lingle

* — *PABX*

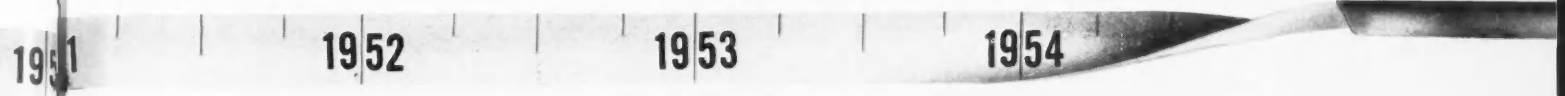
LEICH

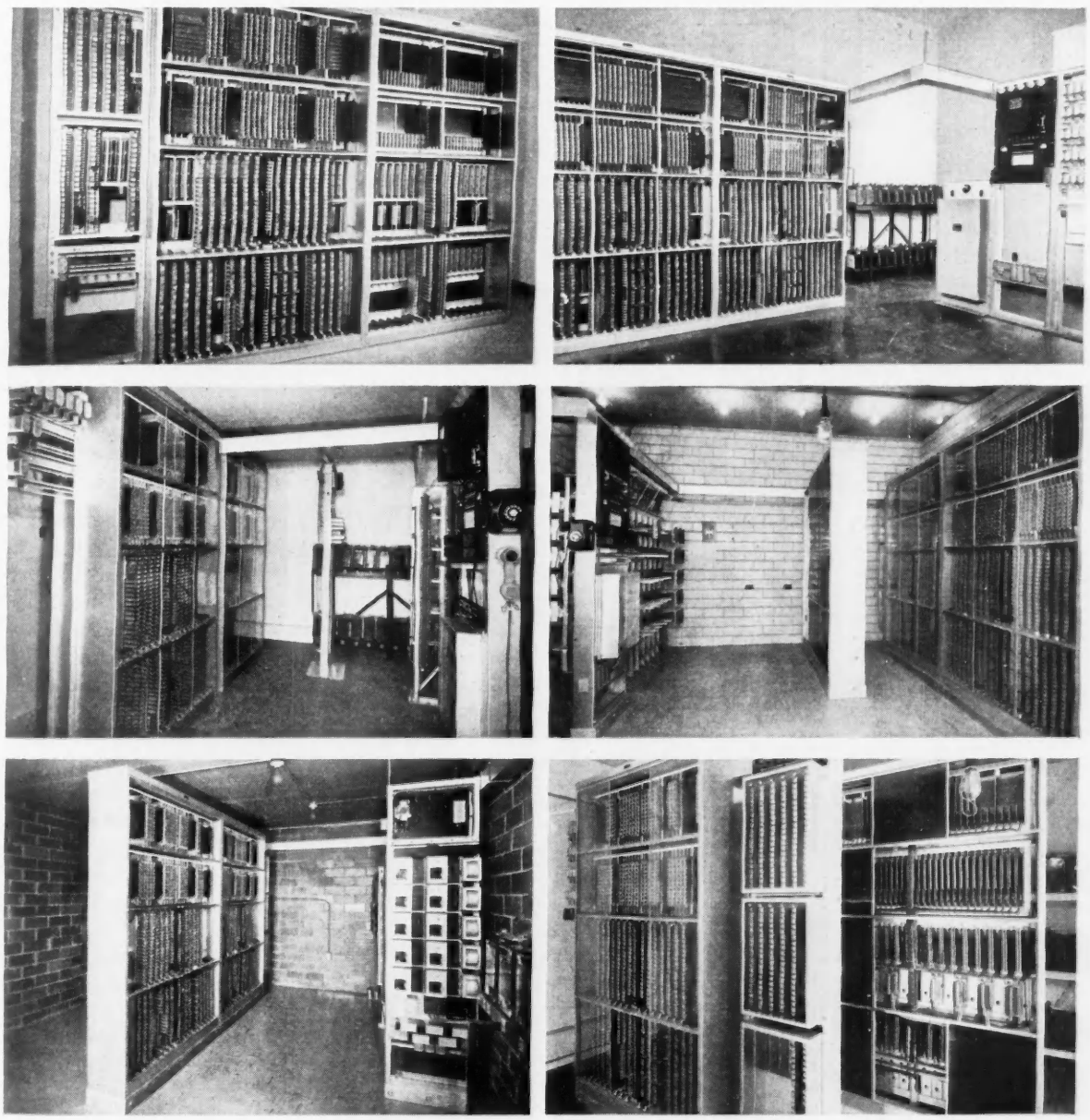
When the Leich Dial System was first announced on September 28, 1947, it presented a new idea in dial switching equipment. The idea was basically to **"uncomplicate"** dial switching. For this dial switchboard was easier to understand and maintain, less costly to install. With it, additions could be made by simply jacking in extra equipment.

Today, almost 450 Leich Dial Systems are installed or being built. The basic idea is still a part of every Leich Dial System. Many improvements have been, and still are being made.

But the big idea — to make a better, faster, easier way to convert to dial — is the main reason why the Leich Dial System has been so enthusiastically received.

If you're considering a dial conversion, it will pay to find out about the Leich Dial System.





MANUFACTURERS OF TELEPHONES, SWITCHBOARDS AND RELATED APPARATUS SINCE 1907
LEICH SALES CORPORATION 427 W. RANDOLPH STREET CHICAGO 6, ILLINOIS
PACIFIC COAST: 2611 SAWTELLE BLVD., LOS ANGELES 64, CALIF. SOUTHWEST: 1227 SLOCUM ST., DALLAS 7, TEXAS

GENERAL TELEPHONE TELEPHONE SYSTEM

arate toll requirements use out calls offered. The weighted co-efficients applying will be from most recently equated peg counts. *Example Two* shows a form of the type used to compute force requirements. The calls entered in *Column* 1 should be multiplied by the coefficient entered in *Column* 3 and the results entered in *Column* 4. The required position hours for each hour should be obtained by reading the units in *Column* 4 into the proper table and entered in *Column* 6.

The entries are corrected, except for the night period, for decimals and the figures in whole numbers shown in *Column* 12. (*Columns* 7 *to* 11 inclusive are not used or explained in this article.)

Rule for Disposing of Decimal Numbers

THE ENTRIES in *Column* 6 should be corrected as to decimals and the requirements in whole numbers entered in *Column* 12, observing the following rules:

(a) Omit the decimal and add 1 to the whole number where the decimal is:
  (1) .5 or more (as 4.6 = 5.)
  (2) larger than the whole number (as 1.3 = 2.)
  (3) all of the number (as .7 = 1.)

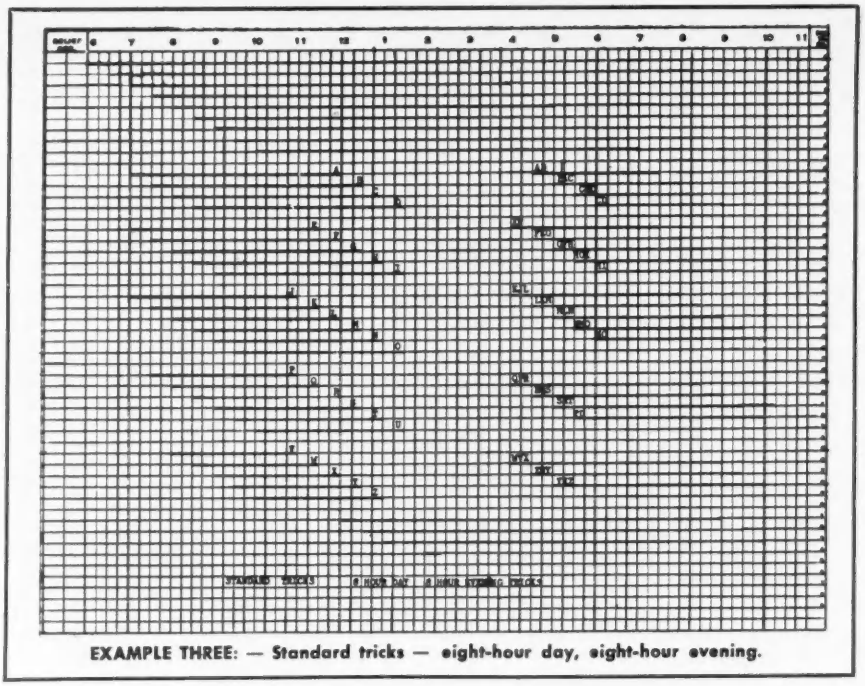
The operator requirements shown indicate the distribution of force by hours on the basis of traffic offered and the number of operators on duty. It may be necessary to make changes in these requirements, if in the judgment of the person responsible for the schedule, local conditions and/or the experience of the force justify increasing or decreasing the provisions.

The formula in the lower right section is used for calculating the number of tricks and the approximate distribution of the various tricks required and as a guide in drawing schedules.

Standard Tricks, Example Three

THE GENERAL types of tricks used in drawing schedules are morning-afternoon, morning-evening, afternoon-evening, night, and where authorized, part-time, and/or short hour evening.

The various tricks under these general classes are shown as *Example* 3. They provide sufficient variety to fit the force to the hourly requirements. *Note*: *All tricks on Example* 3 *are shown as* 8*-hour tricks*, though some companies use 7 and 6-hour evening tricks. Half sessions of 8-hour tricks are suggested for assignment to part-time operators.



EXAMPLE THREE: — Standard tricks — eight-hour day, eight-hour evening.

In applying these tricks, you will note that one group consists of continuous tricks, and the other consists of split tricks. The split tricks are lettered and are in various categories. In order to get the correct combination of morning and evening tours, match the letter on the morning tour with the same letter on the evening tour. The order of the letters shows the preference for the various combinations. An evening half trick lettered A, B, should be combined preferably with a morning half trick A, with B as a second choice, etc.

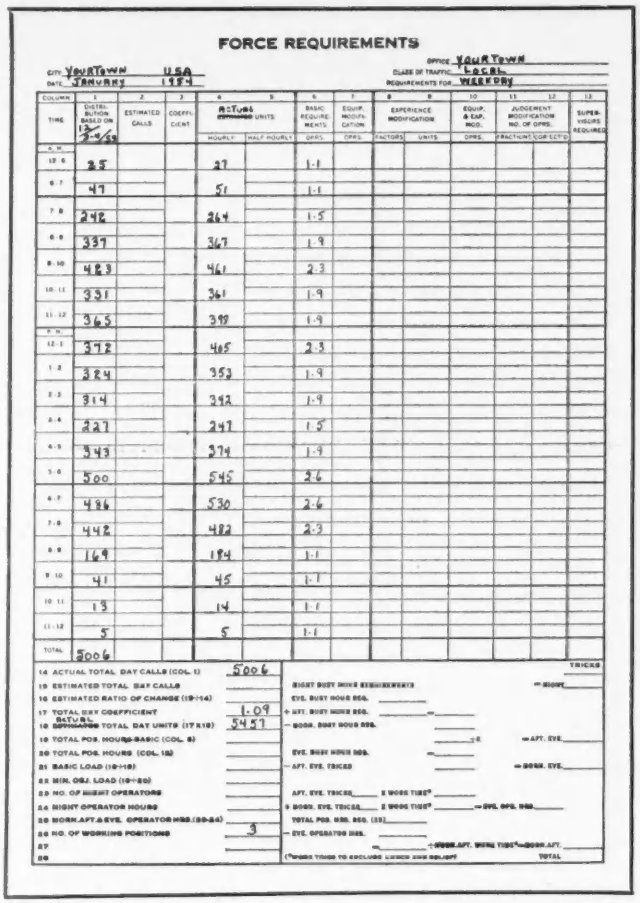
We feel that it is very important that only authorized tricks be assigned, and particular care should be exercised in arranging morning-evening tricks. Such tricks are essential to economical schedule arrangement, but they should be arranged so that they will be the most desirable of the evening tricks. Your choice of the evening tour will depend on the hourly coverage you desire. You will note that all split tricks have certain characteristics, such as these:

(1) No tour is over five hours or less than three hours.
(2) No trick is split over five hours or less than four hours.
(3) No trick begins before 7:00 A.M.
(4) No afternoon tour begins before 4:00 P.M.

It is well to keep these points in mind when scheduling a split trick. Lunches and relief periods should be assigned in accordance with the following rules:

(1) Lunch periods of one hour should occur preferably between 11:00 A.M. and 2:00 P.M., and as near the middle of the trick as possible. In some cases it may be necessary to start lunches at 10:30 A.M. and end them as late as 2:30 P.M. In such cases, the number of early or late lunches should be kept at the minimum and those beginning at 10:30 A.M. should be assigned to morning-afternoon operators who report at 7:00 A.M. or earlier, and those ending at 2:30 P.M. to morning-afternoon operators who report at 9:00 A.M. or later. Lunch periods should not start or end less than three hours from the start or end of the trick.
(2) Supper periods of one hour should occur between 4:00 P.M. and 7:00 P.M. and should not start or end less

Please Turn To Page 66



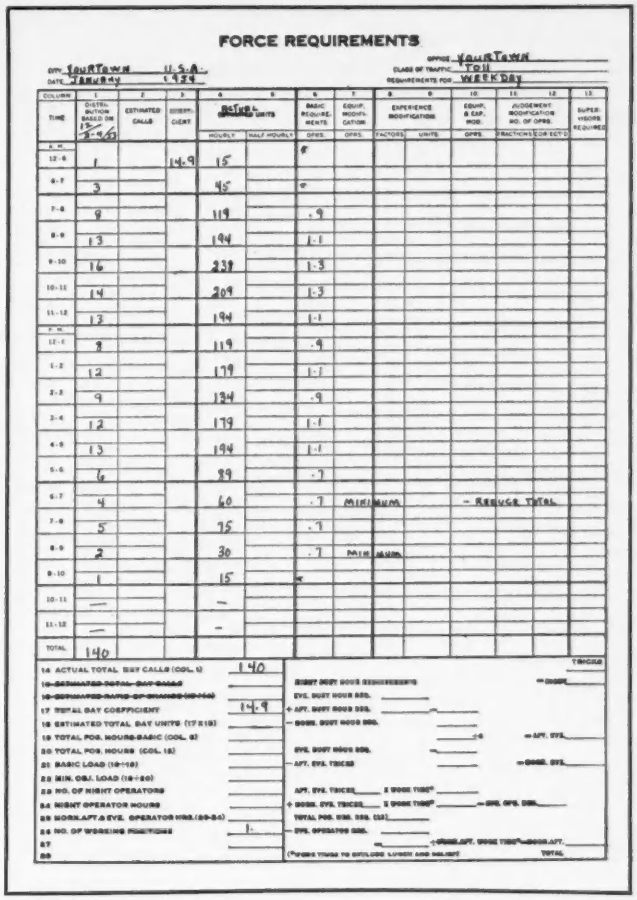
FORCE REQUIREMENTS

CITY YOURTOWN USA
DATE JANUARY 1954
OFFICE YOURTOWN
CLASS OF TRAFFIC LOCAL
REQUIREMENTS FOR WEEKDAY

TIME	DISTRIBUTION BASED ON 15-MIN. 7-9 AM	ESTIMATED CALLS	COEFFICIENT	ACTUAL ESTIMATED UNITS HOURLY	ACTUAL ESTIMATED UNITS HALF HOURLY	BASIC REQUIREMENTS OPRS.	EQUIP. MODIFICATION OPRS.	EXPERIENCE MODIFICATION FACTORS	EXPERIENCE MODIFICATION UNITS	EQUIP. & EXP. MOD. OPRS.	JUDGEMENT MODIFICATION NO. OF OPRS. FRACTIONS	JUDGEMENT MODIFICATION NO. OF OPRS. CORRECTD	SUPERVISORS REQUIRED
A.M.													
12-6	25			27		1.1							
6-7	47			51		1.1							
7-8	248			264		1.5							
8-9	337			367		1.9							
9-10	423			461		2.3							
10-11	331			361		1.9							
11-12	365			399		1.9							
P.M.													
12-1	372			405		2.3							
1-2	324			353		1.9							
2-3	314			342		1.9							
3-4	227			247		1.5							
4-5	343			374		1.9							
5-6	500			545		2.6							
6-7	486			530		2.6							
7-8	442			482		2.3							
8-9	169			184		1.1							
9-10	41			45		1.1							
10-11	13			14		1.1							
11-12	5			5		1.1							
TOTAL	5006												

14 ACTUAL TOTAL DAY CALLS (COL. 1) 5006
15 ESTIMATED TOTAL DAY CALLS
16 ESTIMATED RATIO OF CHANGE (15÷14)
17 TOTAL DAY COEFFICIENT ACTUAL 1.09
18 ESTIMATED TOTAL DAY UNITS (17 X 13) 5457
19 TOTAL POS. HOURS-BASIC (COL. 6)
20 TOTAL POS. HOURS (COL. 12)
21 BASIC LOAD (19÷10)
22 MIN. OBJ. LOAD (19÷20)
23 NO. OF NIGHT OPERATORS
24 NIGHT OPERATOR HOURS
25 WORK.APT.& EVE. OPERATOR HRS.(20-24)
26 NO. OF WORKING POSITIONS 3
27
28

TRICKS
NIGHT DUST HOUR REQUIREMENTS — NIGHT
EVE. DUST HOUR REQ.
+ APT. DUST HOUR REQ. — APT. EVE.
— NIGHT. DUST HOUR REQ. — NIGHT. EVE.
APT. EVE. TRICKS X WORK TIME* —
+ NIGHT. EVE. TRICKS X WORK TIME* — EVE. OPR. REQ.
TOTAL POS. HRS. REQ. (23)
— EVE. OPERATOR REQ. —
+ (*WORK TIME APT. WORK TIME* — NIGHT APT.
(*WORK TIMES TO EXCLUDE LUNCH AND RELIEF) TOTAL



FORCE REQUIREMENTS

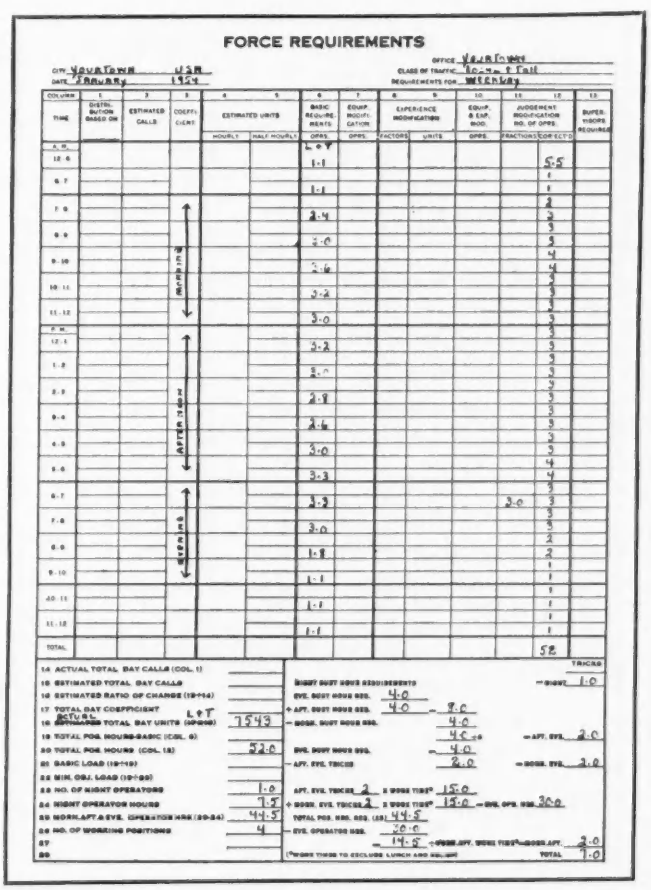
CITY YOURTOWN U.S.A.
DATE JANUARY 1954
OFFICE YOURTOWN
CLASS OF TRAFFIC TOLL
REQUIREMENTS FOR WEEKDAY

TIME	DISTRIBUTION BASED ON 15-MIN. 7-9 AM	ESTIMATED CALLS	COEFFICIENT	ACTUAL ESTIMATED UNITS HOURLY	ACTUAL ESTIMATED UNITS HALF HOURLY	BASIC REQUIREMENTS OPRS.	EQUIP. MODIFICATION OPRS.	EXPERIENCE MODIFICATION FACTORS	EXPERIENCE MODIFICATION UNITS	EQUIP. & EXP. MOD. OPRS.	JUDGEMENT MODIFICATION NO. OF OPRS. FRACTIONS	JUDGEMENT MODIFICATION NO. OF OPRS. CORRECTD	SUPERVISORS REQUIRED
A.M.													
12-6	1		14.9	15		0							
6-7	3			45		0							
7-8	8			119		.9							
8-9	13			194		1.1							
9-10	16			238		1.3							
10-11	14			209		1.3							
11-12	13			194		1.1							
P.M.													
12-1	8			119		.9							
1-2	12			179		1.1							
2-3	9			134		.9							
3-4	12			179		1.1							
4-5	13			194		1.1							
5-6	6			89		.7							
6-7	4			60		.7	MINIMUM			— REDUCE TOTAL			
7-8	5			75		.7							
8-9	2			30		.7	MINIMUM						
9-10	1			15		*							
10-11	—			—									
11-12	—			—									
TOTAL	140												

14 ACTUAL TOTAL DAY CALLS (COL. 1) 140
15 ESTIMATED TOTAL DAY CALLS
16 ESTIMATED RATIO OF CHANGE (15÷14)
17 TOTAL DAY COEFFICIENT 14.9
18 ESTIMATED TOTAL DAY UNITS (17 X 13)
19 TOTAL POS. HOURS-BASIC (COL. 6)
20 TOTAL POS. HOURS (COL. 12)
21 BASIC LOAD (19÷10)
22 MIN. OBJ. LOAD (19÷20)
23 NO. OF NIGHT OPERATORS
24 NIGHT OPERATOR HOURS
25 WORK.APT.& EVE. OPERATOR HRS.(20-24)
26 NO. OF WORKING POSITIONS 1.
27
28

TRICKS
NIGHT DUST HOUR REQUIREMENTS — NIGHT
EVE. DUST HOUR REQ.
+ APT. DUST HOUR REQ. — APT. EVE.
— NIGHT. DUST HOUR REQ. — NIGHT. EVE.
APT. EVE. TRICKS X WORK TIME* —
+ NIGHT. EVE. TRICKS X WORK TIME* — EVE. OPR. REQ.
TOTAL POS. HRS. REQ. (23)
— EVE. OPERATOR REQ. —
+ (*WORK TIME APT. WORK TIME* — NIGHT APT.
(*WORK TIMES TO EXCLUDE LUNCH AND RELIEF) TOTAL

EXAMPLE TWO: — The three forms (2-A left, 2-B right, and 2-C below) on this page represent actual traffic at a common battery tributary of 1150 stations.



FORCE REQUIREMENTS

CITY YOURTOWN USA
DATE FEBRUARY 1954
OFFICE YOURTOWN
CLASS OF TRAFFIC LOCAL & TOLL
REQUIREMENTS FOR WEEKDAY

TIME	DISTRIBUTION BASED ON	ESTIMATED CALLS	COEFFICIENT	ESTIMATED UNITS HOURLY	ESTIMATED UNITS HALF HOURLY	BASIC REQUIREMENTS OPRS.	EQUIP. MODIFICATION OPRS.	EXPERIENCE MODIFICATION FACTORS	EXPERIENCE MODIFICATION UNITS	EQUIP. & EXP. MOD. OPRS.	JUDGEMENT MODIFICATION NO. OF OPRS. FRACTIONS	JUDGEMENT MODIFICATION NO. OF OPRS. CORRECTD	SUPERVISORS REQUIRED
A.M.						LOT							
12-6						1.1						5.5	
6-7						1.1						1	
7-8						2.4						2	
8-9						3.0						3	
9-10						3.6						4	
10-11						3.2						3	
11-12						3.0						3	
P.M.													
12-1						3.2						3	
1-2						2.7						3	
2-3						2.8						3	
3-4						2.6						3	
4-5						3.0						3	
5-6						3.3						4	
6-7						3.2				3.0		3	
7-8						3.0						3	
8-9						1.8						2	
9-10						1.1						1	
10-11						1.1						1	
11-12						1.1						1	
TOTAL												58	

MORNING
AFTERNOON
EVENING

14 ACTUAL TOTAL DAY CALLS (COL. 1)
15 ESTIMATED TOTAL DAY CALLS
16 ESTIMATED RATIO OF CHANGE (15÷14)
17 TOTAL DAY COEFFICIENT ACTUAL LOT
18 ESTIMATED TOTAL DAY UNITS (17×13) 7543
19 TOTAL POS. HOURS-BASIC (COL. 6)
20 TOTAL POS. HOURS (COL. 12) 42.0
21 BASIC LOAD (19÷10)
22 MIN. OBJ. LOAD (19÷20)
23 NO. OF NIGHT OPERATORS 1.0
24 NIGHT OPERATOR HOURS 7.5
25 WORK.APT.& EVE. OPERATOR HRS (20-24) 44.5
26 NO. OF WORKING POSITIONS 4
27
28

TRICKS
NIGHT DUST HOUR REQUIREMENTS — NIGHT 1.0
EVE. DUST HOUR REQ. 4.0
+ APT. DUST HOUR REQ. 40 — 9.0
— NIGHT. DUST HOUR REQ. 4.0
45 ÷ 8 — APT. EVE. 2.0
EVE. DUST HOUR REQ. — 4.0
— APT. EVE. TRICKS 2.0 — NIGHT. EVE. 3.0
APT. EVE. TRICKS 2 X WORK TIME* 15.0
+ NIGHT. EVE. TRICKS 2 X WORK TIME* 15.0 — EVE. OPR. REQ. 30.0
TOTAL POS. HRS. REQ. (23) 44.5
— EVE. OPERATOR REQ. 20.0
14.5 ÷ (*WORK APT. WORK TIME* — NIGHT APT. 2.0
(*WORK TIMES TO EXCLUDE LUNCH AND RELIEF) TOTAL 7.0

Automatic's P-A-B-X's make Friends

Experience shows Automatic's P-A-B-X's do much to create a feeling of warm good will for the telephone company!

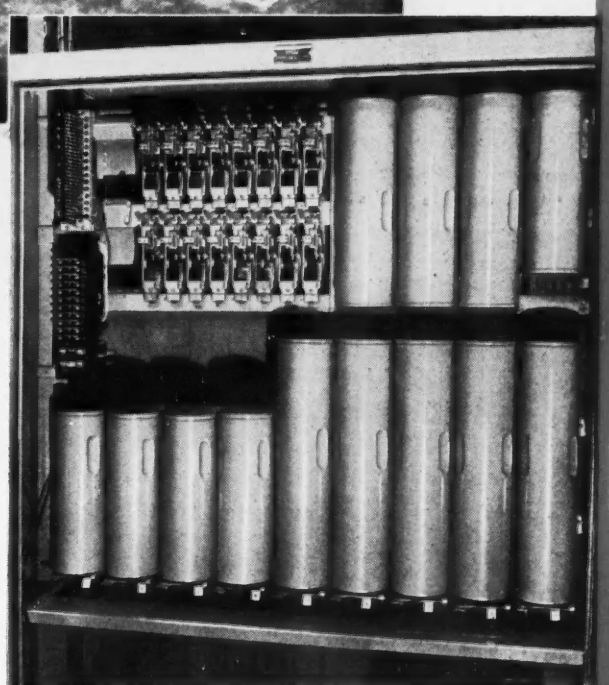
In orphanages, schools, hospitals, and other institutions, a Private Automatic Branch Exchange draws public interest and approval because it expedites work that affects the public directly. In business organizations, too—in stores, offices, factories—it provides fast internal communications that saves steps and **gets things done.** That's why P-A-B-X brings both extra revenue and a wealth of new friends! With P-A-B-X systems of any size, "inside" calls are made quickly, easily, by dialing. Service on incoming and outgoing calls is improved too. On small systems, incoming calls can be "picked up" at any non-restricted telephone and transferred as required; no attendant is needed. On larger systems, incoming calls are distributed by an attendant; outgoing calls are dialed direct or handled by the attendant, as preferred.

Automatic's P-A-B-X's make it easier for you to secure new P-A-B-X business, because they offer services to meet **every** need. We've prepared a 28-page booklet, which describes our full P-A-B-X line—from small models serving 10 telephones to large models serving over 200. Send for Catalog TM 4060-B today. And remember: our representatives are glad to work with you to help you sell P-A-B-X service!

• PHOTOS COURTESY ST. VINCENT'S VILLA a Catholic orphanage at Fort Wayne, Ind.

Left: P-A-B-X service saves time and confusion as a Sister calls the office to request a pass for two students to visit friends outside.

Directly below: Fast, dependable P-A-B-X service connects the administration building in the background with dormitory buildings in the foreground.



Right: Automatc Electric Type 33A6 P-A-B-X serves 20 stations within St. Vincent's, and links the orphanage with the public telephone system.

s for you

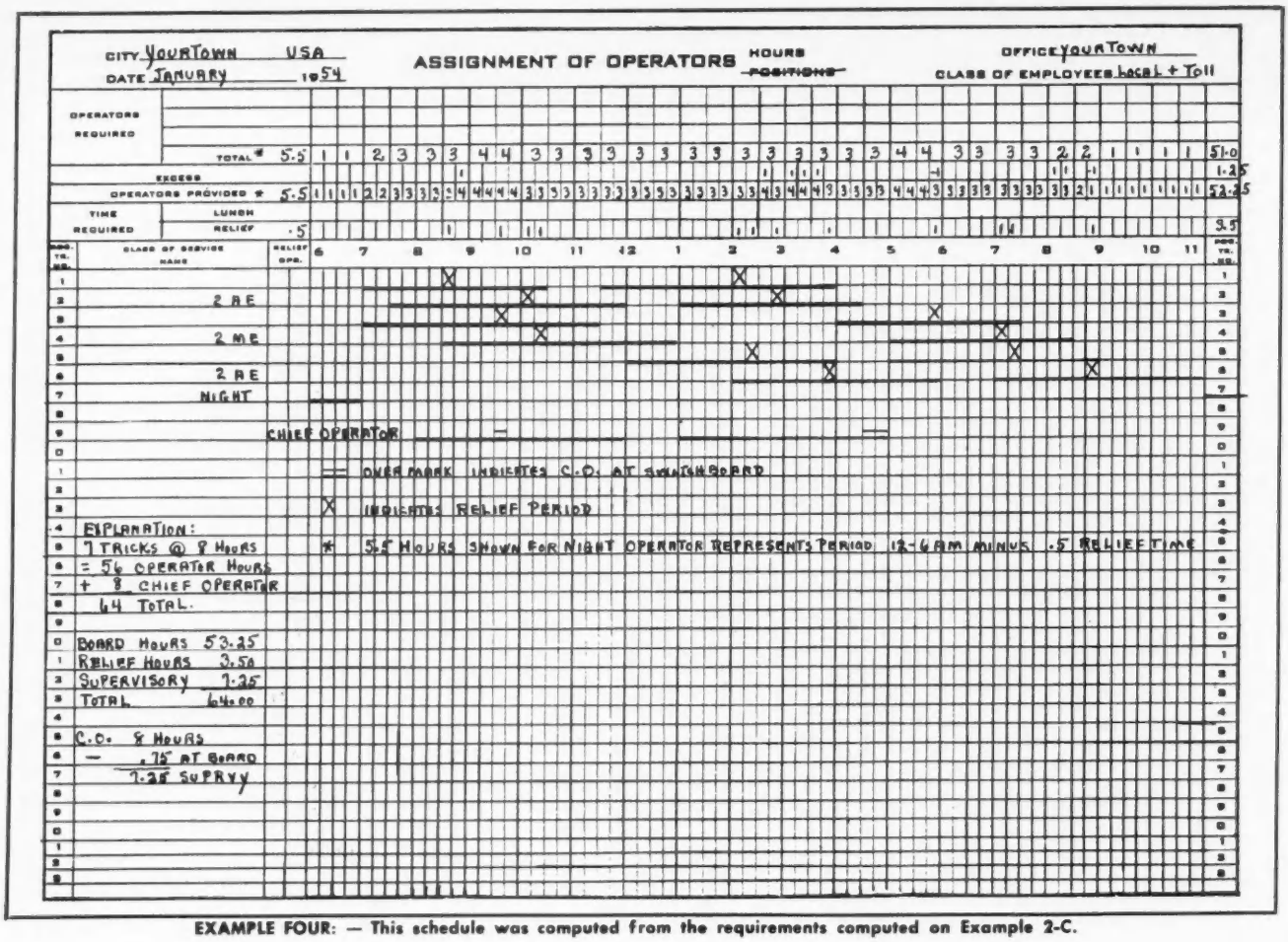
—and money, too!

AUTOMATIC ELECTRIC

Originators and Developers of the Strowger Step-by-Step "Director" for Register-Sender-Translator Operation . . . Machine Switching Automatic Dial Systems

Makers of **Telephone, Signaling and Communication Apparatus • Electrical Engineers, Designers and Consultants**

Distributors in U. S. and Possessions: AUTOMATIC ELECTRIC SALES CORPORATION
Export Distributors: International Automatic Electric Corporation
1033 West Van Buren Street, Chicago 7, U. S. A.



EXAMPLE FOUR: — This schedule was computed from the requirements computed on Example 2-C.

than three hours from the start or end of the tour.

(3) Relief periods of 15 minutes should occur as near the middle of the tour as possible and in no case should a relief start or end less than one hour from the start or end of a tour.

In scheduling reliefs and lunches, they should be distributed as evenly as possible so as to facilitate the relieving of operators at the board with the least effect on service.

A form similar to that shown as *Example* 4 is used to prepare an operator's schedule. (Such a form may be outlined on easily procured cross bar paper.)

For small exchanges where both local and toll calls are handled by all operators on duty, the operating requirements are combined and a single schedule provided. In general it is expected that such a schedule will be in effect for several months and will not require the use of supplementary tricks.

Where positions are provided for toll use only and/or in exchanges handling 75 or more toll calls a day it is generally more desirable to compute local and toll requirements separately, even though the force is scheduled as a single unit. Traffic in such exchanges may fluctuate enough to require additional, or supplementary tricks, during some periods. A knowledge of these traffic variations will indicate whether such a trick or tricks is used one or two days a week, during special event periods, or to cover the requirements of an increased overall volume of traffic. *See Example* 5.

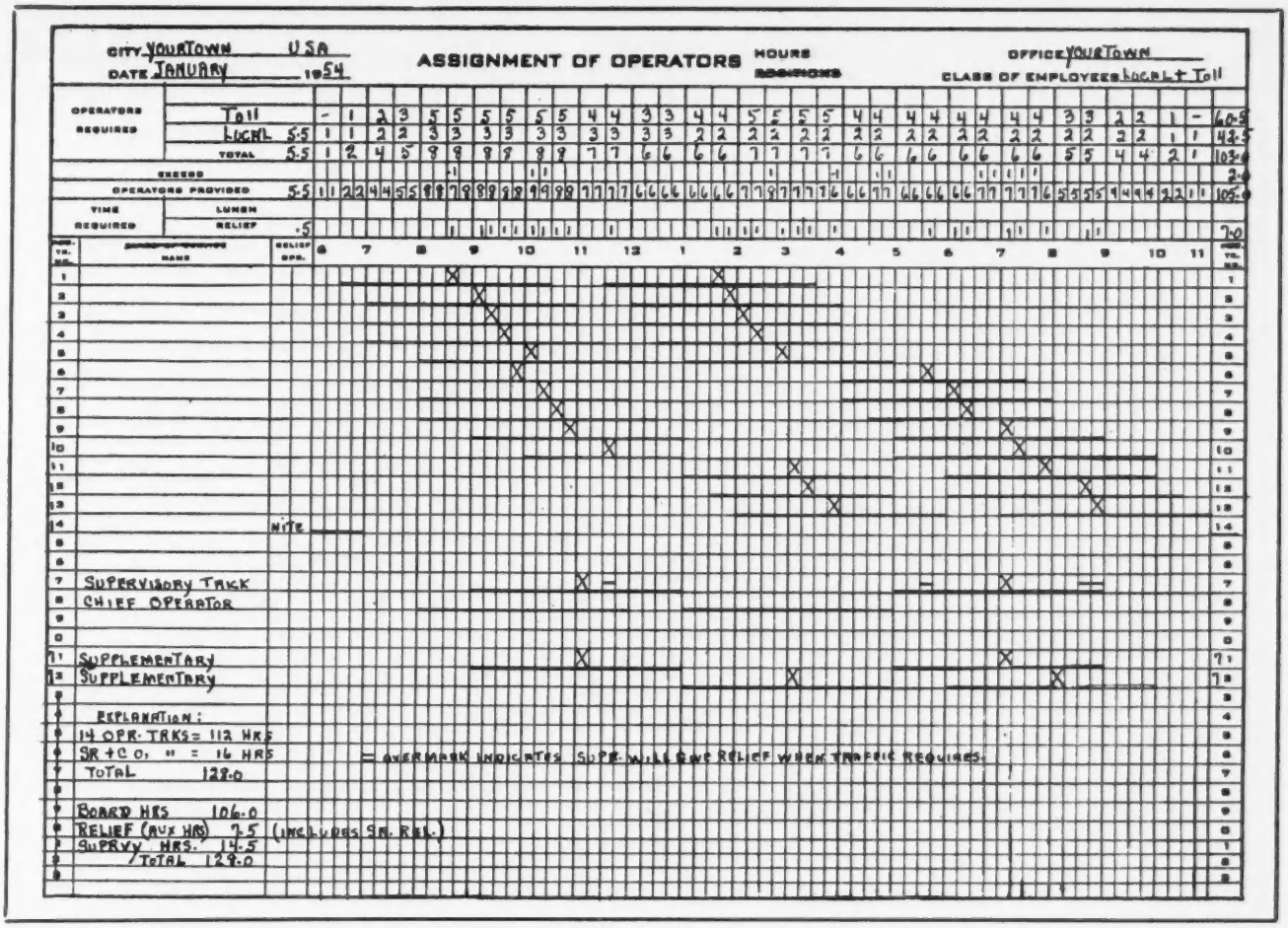
RUTH E. RICHARDS, author of TELEPHONE ENGINEER & MANAGEMENT'S Traffic Department articles, is Methods Supervisor of the General Telephone Co. of Illinois, Springfield.

The drawing of schedules involves considerable trial and adjustment, but certain general rules may be outlined as to the various steps.

The half-hourly requirements for the groups of operators which are to be scheduled together should be entered on the lines opposite "Operators Required" and totaled.

The total number of tricks required as determined from the "Force Requirements" data will include the night trick. On the line numbered to correspond with the number of tricks draw in the portion of the night trick which will appear on the form, for example 6-7 A.M. for a trick assigned 11:00 P.M. to 7:00 A.M.

On each successive line upward draw tricks of the proper category to satisfy the requirements for each half hour being guided by the number of M-A, M-E, and A-E tricks.



EXAMPLE FIVE: — This schedule of hours was drawn from the requirements for a small toll center serving 1700 stations plus toll from several tributaries.

Against "Operators Provided" enter the number of employes provided for each quarter hour as above, excluding relief periods.

Readjustment

IT WILL BE found usually, under the preliminary provision as above, that some periods will not have a sufficient number of operators to cover the requirements. It will be necessary to make adjustments to cover the discrepancies, by shifting tricks to earlier or later times, taking care to use half tricks which can be combined as indicated by the letters as explained under "Standard Tricks."

If the excess provided by a schedule (difference between required and provided) is 4 hours or more it indicates that some rearrangement should be made to reduce the excess.

In the final form as an office record we prefer to indicate tricks of different categories with different colors, for example, blue for morning-afternoon, red for split, i.e., morning-evening, and green for afternoon-evening.—THE END.

Homer Wright Elected V. P. of So. Continental

HOMER J. WRIGHT, Tennessee general manager for the Southern Continental Telephone Co. has been elected vice-president and Kentucky general manager in charge of the Kentucky Division of the company with headquarters at Elizabethtown.

MRS. FLORENCE WALKER, operator and chief operator for 37-½ years at the Whittier, Calif., exchange represented General Tel. Co. of Calif. at a recent dinner commemorating the 75th anniversary of women as telephone operators.

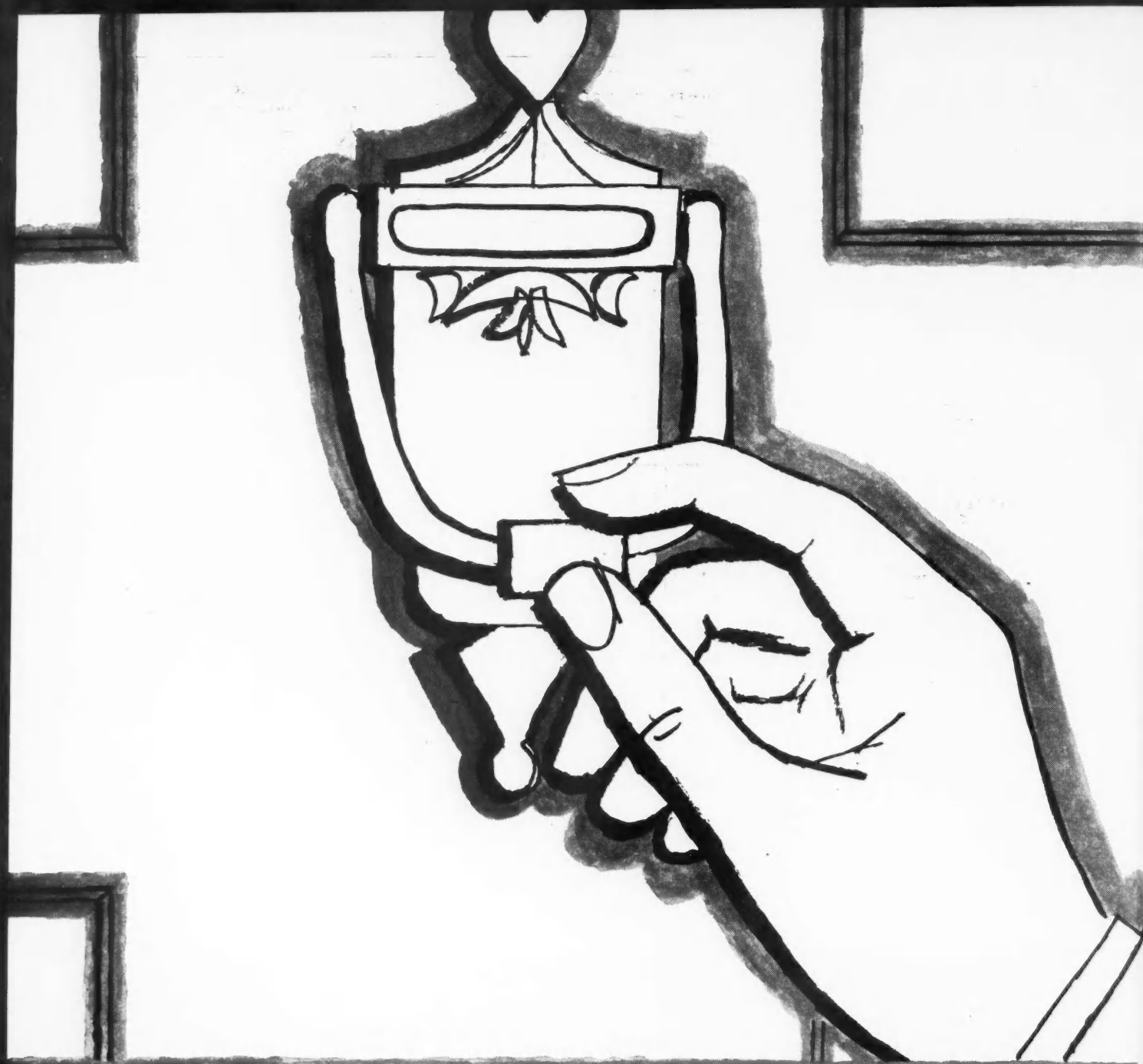
Mr. Wright transferred to Cookeville in Nov., 1948 as Tennessee state manager for the company and was promoted to general manager in charge of the company's Tennessee operations in Jan., 1951.

He served as a member of the Board of Directors of the Tennessee Telephone Association for three years and served as President of the Association.

Western Union Names Johnson Sales Director

JOSEPH D. JOHNSON has been appointed Western Union Telegraph Co. director of sales, services and advertising, with headquarters at New York City.

Although he is one of the youngest national executives in the communications field, Mr. Johnson has had a wide range of experience with Western Union. After attending the University of Chicago, he became a branch manager for the telegraph company in 1927.



NEXT BEST TO A VISIT

In this wonderful land of universal telephone service, our voices go visiting far more often than we can ourselves.

Thus, the telephone strengthens ties between families and friends and sweethearts. That's a great part of the telephone's value.

It's the story the advertisement across the page tells millions of readers of February magazines. (And telephone people will be specially interested in the "Call by Number" reminder. When customers "Call by Number," their service is faster . . . and we can serve them better.)

Miles Apart yet Heart-to-Heart

by Long Distance

When you're far away from someone, there's nothing like a telephone call to bring you near. The sound of a warm, familiar voice and the eager exchange of personal news is almost as satisfying as an actual visit.

Near or far, wherever they are, friends appreciate your calling. Long Distance calls cost little—especially after six every evening and all day Sunday. Then you can talk from Cleveland to Detroit for as little as 40¢; Chicago to Omaha for only 85¢; New York to Los Angeles for only $2. (These are the 3-minute, station-to-station rates and do not include federal excise tax.)

Somewhere today there is someone who would like to hear your voice.

YOU SAVE TIME WHEN YOU CALL BY NUMBER

When you're calling out-of-town, it will speed your call if you can give the operator the number you want. It's easier, too.

Bell Telephone System

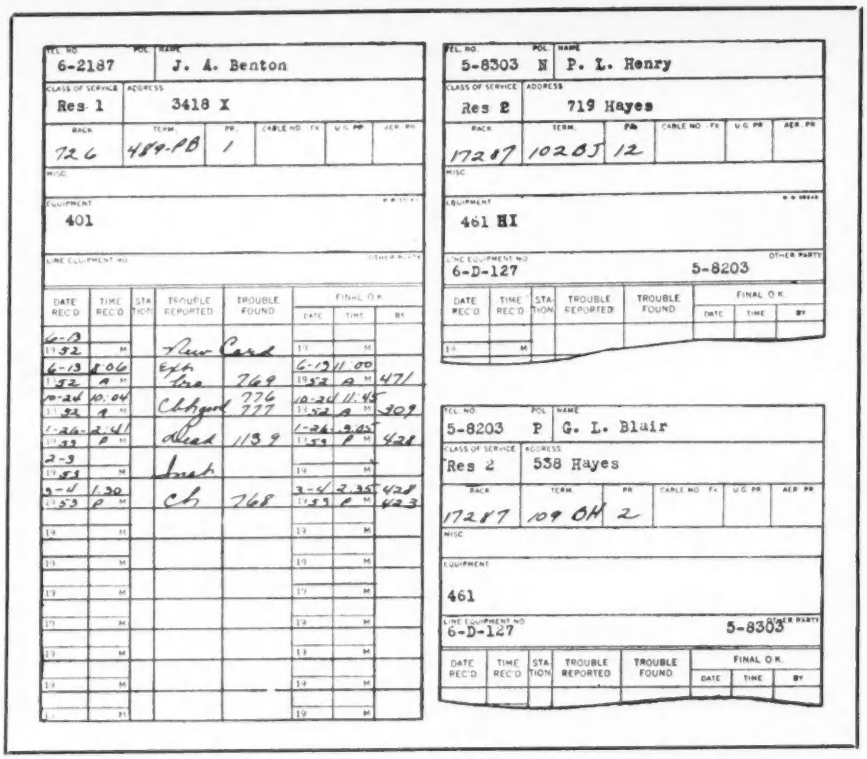


FIGURE TWENTY-THREE — These subscriber record cards are designed for exchanges operating on terminal-per-station basis. At left is an example of an individual line card. At top right is the heading for a card used for a negative number on a two-party line. At bottom right is a card for the associated positive number on the party line.

CABLE PLANT CONSTRUCTION

By JOHN S. REED

In Part II-C of his training course, Mr. Reed discusses — (1) Recording Use of Spare Pairs, (2) Main Frame Number Entries — Cross Connecting Terminal Pairs, and (3) the Cross-Connecting Terminal Record.

Recording Use of Spare Pairs

AT THE BOTTOM of the page, under Remarks and Pair Data, space is provided for recording special information. For example, one or more cable pairs on the record page may be defective. This information is noted in this space, giving the pair numbers involved, the nature of trouble, what was done to temporarily clear the fault, and the case number of the trouble. This data is entered with hard pencil, and is later erased when the trouble is permanently cleared. Spare pairs assigned to replace defective pairs are also indicated in this space. In this case, the rack number and the pair number of the extra pair are shown.

Spare pairs in the entering cable are disposed of in accordance with the established practice of the telephone company. They may be eliminated from the rack count or be included therein. When omitted from the count, these spare pairs are connected to extra terminal lugs on the main frame. In the cable terminals, they are connected to additional posts already provided in the cable terminals such as pair 16 in 15-pair terminals and pair 26 in 25-pair terminals whether or not they are included in the count. The omission of spare pairs produces a more uniform arrangement of the main frame numbers in the cable record.

The extra pairs in the terminals are connected to the spare pair of each 100-pair group of the main or feeder cables. Each 100-pair group of terminations would thus have additional lugs for the extra pair in the group. Although these extra pairs do not actually appear in the cable record, they are referred to as pair number 100+1, 200+1, --- 600+1, --- 1000+1, etc., according to the order of the rack count. Thus, when a spare pair is used for station assignment

(because of cable congestion), the assignment is listed in the cable record at the bottom of the record page showing the terminal in which the spare pair is used. Frequently, in new construction, if a section of cable has a bad pair from which the trouble cannot be cleared, the spare pair is used in this particular section to replace the bad pair.

When a working pair goes bad and cannot be repaired, the spare pair in the group with the defective working pair is cut in place of the bad pair and a notation of this change is made in the cable record as previously explained. Cable splicers also use the spare pairs for talking circuits in tagging operations or for testing.

Main Frame Number Entries — Cross Connecting Terminal Pairs

IN THE COLUMN at the side of the terminal exposure section, are entered the main frame or rack numbers. This column accommodates 50 pairs. The rack count, for example, would start at 3201 and continue down to 3250, the last pair on this page. When M. F. numbers are entered in this column, the words "Aerial Pairs" in the heading are crossed out.

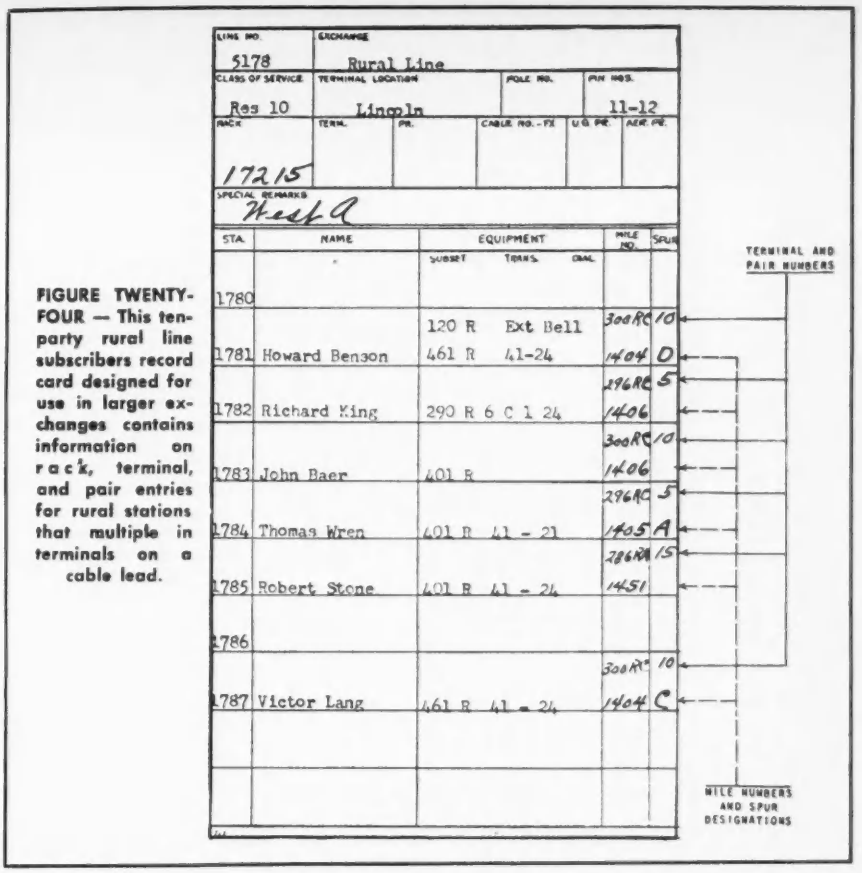

LINE NO. 5178
EXCHANGE Rural Line
CLASS OF SERVICE Res 10
TERMINAL LOCATION Lincoln
POLE NO.
PIN NOS. 11-12
RACK 17215
TERM.
PR.
CABLE NO. - FX
U.G. PR.
AER. PR.
SPECIAL REMARKS West A
STA.
NAME
EQUIPMENT
SUBSET
TRANS.
CALL
MILE NO.
SPUR
1780
1781 Howard Benson 120 R Ext Bell 461 R 41-24 300RC 10 1404 D
1782 Richard King 290 R 6 C 1 24 296RC 5 1406
1783 John Baer 401 R 300RC 10 1406
1784 Thomas Wren 401 R 41 - 21 296RC 5 1405 A
1785 Robert Stone 401 R 41 - 24 286RA 15 1451
1786
1787 Victor Lang 461 R 41 - 24 300RA 10 1404 C
TERMINAL AND PAIR NUMBERS
MILE NUMBERS AND SPUR DESIGNATIONS

FIGURE TWENTY-FOUR — This ten-party rural line subscribers record card designed for use in larger exchanges contains information on rack, terminal, and pair entries for rural stations that multiple in terminals on a cable lead.

If pairs of a cross-connecting terminal are involved, the U. G. pair numbers are entered in the last column of the terminal exposure section as shown in *Figure* 21. Since a terminal of this kind may have as

TERMINAL NUMBERS — SECTION, RANGE AND TOWNSHIP NUMBERS — TERMINALS IN MULTIPLE — PAIRS IN MULTIPLE

LINE NO. 4035 M. F. NO. 47 CABLE NO. TERMINAL 3a-32, 3a-38, 3a-49 PAIRS 2, 2, 22

LONG LINE PROTECTOR NO. LONG LINE RELAY NO. AUTOMATIC C. BATTERY MAGNETO PINS 788 West

NUMBER	NAME		ADDRESS		EQUIPMENT
1	Rife, Glenn	3a-49	NE	15-8-10	290 R
2					
3	Schafer, Orville E	3a-32	NW	2-8-10	461 R
4	Schafer, M. R	3a-49	SW	10-8-10	461 R
5	Schafer, Glenn	3a-32	SW ½	3-8-10	461 R
6	Reiverts, Lloyd W.	3a-49	NE	3-8-10	461 R
7	Barry, Wm.	3a-38	SE	10-8-10	461 R
8	Zuiskal, Leo	3a-49	SW	11-8-10	290 R
9	Rife, C. M.	3a-38	NW	15-8-10	290 R
0					

DATE	TIME REC'D	COMPLAINT NUMBER	COMPLAINT NATURE	Class	TEST V. M.	TEST TIME	TEST BY	Time Given Out	GIVEN TO	TROUBLE FOUND AND WORK DONE	TIME O. K.
3/18/50		355	Order D-	11	Install				K.K.	Shafer, Glenn R.F.D #3	
4/3/50		356	Order cg	31	Chg. eqpt + Instl			Move	E.B.	Reiverts, Lloyd W. R.F.D #3	

FIGURE TWENTY-FIVE — Designed for use in smaller exchanges, this subscribers card record form indicates rack, terminal, and pair entries for rural stations that multiple in terminals on the same lead.

many as 600 pairs, the U. G. pair numbers will be entered on as many as twelve pages of the cable record. The page code designation for the cross-connecting terminal, for example, "A," is entered at the top of the list of U. G. pairs.

The next column to the right is used for listing the pair numbers on the aerial cable side of the cross-connecting terminal. This column also may be used when aerial pairs are bridged. "M. F. No." is crossed out when aerial pairs are entered in this column and the cross-connecting terminal number is shown in the heading.

The terminal exposure section does not list the terminals associated with the aerial pairs connected to the U. G. pairs in the cross-connecting terminal. Only the terminals in which the U. G. pairs appear (through risers) are entered in this section; accordingly a separate sheet is maintained for each cross-connecting terminal in order to show the information on the aerial pairs and their terminals. This separate record will be discussed later.

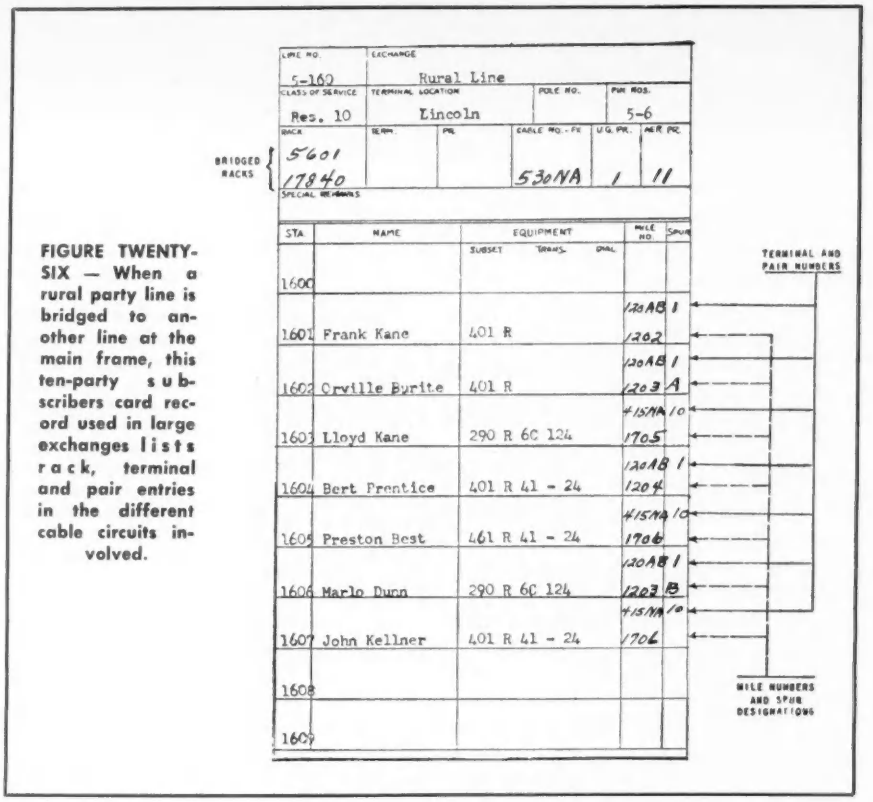


FIGURE TWENTY-SIX — When a rural party line is bridged to another line at the main frame, this ten-party subscribers card record used in large exchanges lists rack, terminal and pair entries in the different cable circuits involved.

Class of Service — Subscriber Telephone Numbers

IN OFFICES where line equipment terminals are provided, line equipment numbers for the stations listed on the cable record page are entered in the column headed, "Line Equipment Numbers." This information is obtained from the line equipment and the connector terminal records.

In the "Class of Service" column is shown the service classification of the subscriber, whether B-1, B-2, R-1, R-2, R-10, SP, PS, or leased circuit. This classification is obtained from the commercial department's work order.

Four columns, each headed, "Subscriber's Number," are to the right of the "Class of Service" column. The first column has, in addition, the designation "Neg." for negative party numbers and the second column, the designation "Pos." for positive party numbers. The first column also lists all one-party lines The third and fourth columns are for additional parties on the same line in exchanges where four-party line service is provided.

In dial offices not equipped with line equipment terminals, even party-number designations are listed in the first column, and odd-party numbers in the second column for two-party line subscribers. In common battery and magneto offices, "W" and "J" or some other designations are used in place of "Neg." and "Pos." designations, respectively, thus 692W and 692J.

The subscribers card record, while primarily intended for recording trouble cases, provides certain data not listed in the cable record sheet. Thus the subscribers' names and addresses associated with the telephone numbers are not given in the cable record and the subscriber's card record must be consulted for this information. *Figure* 23 illustrates headings of subscriber's record cards for individual and two-party lines in a terminal-per-station office. A different type of subscriber's card record is used for smaller exchanges as illustrated in *Figures* 25 *and* 27.

Reference to the subscriber's card record is needed to determine the names of subscribers and their station digits (in telephone number) when a ten-party rural line is involved. In the cable record, the ten-party lines are listed in the first column under "Subscriber's Number" by their line numbers, as, for example, 5-178.

In some instances, the rural line is on a cable pair feeding to stations from terminals in multiple. In such cases, entries are made on the subscriber's card as shown in *Figures* 24 *and* 25. In other situations, the rural stations may feed from different cable counts, which necessitates the bridging of racks. Each of the different racks, terminals, and terminal pairs are then listed as indicated in *Figures* 26 *and* 27.

Associated with each subscriber's number column is another column, headed, "Terminal." The page code number of the terminal serving the subscriber is entered in this space.

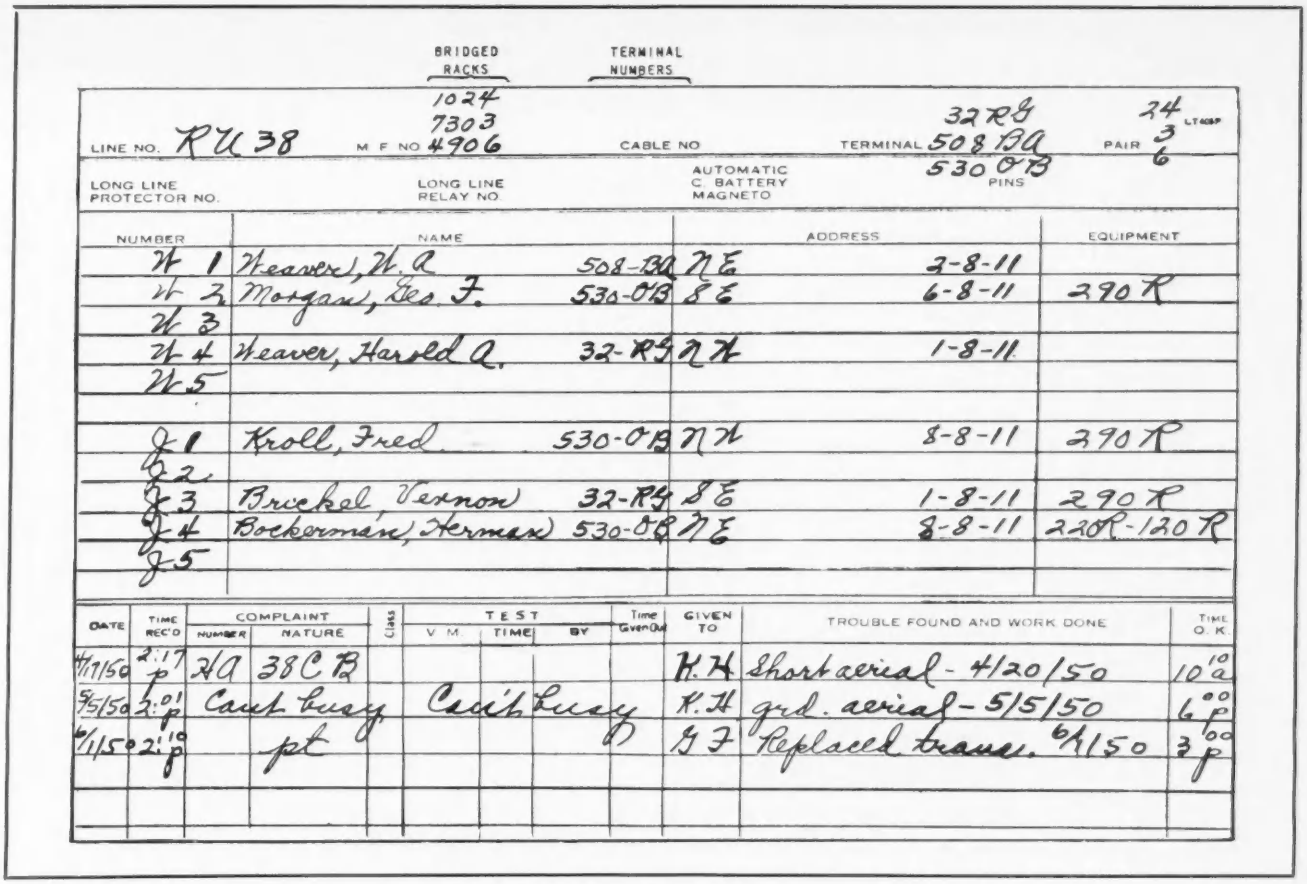
The assignment record at the right of the last "Terminal" column consists of three columns for entering the following information:

(a) Kind of Order or Transfer — The reason for change of pair assignment is indicated here, as remove, move-remove, or change ("R," "Mr," or "Cg"). This information is obtained from the commercial department's work order.

(b) Order Number — The number of the work order is entered here.

(c) Date — This is the date the order was received. In some cases, as when a remove or move-remove order is involved, the due date is shown, or the copy is marked "Hold."

All entries on class of service, subscriber's number, terminal feed, and



BRIDGED RACKS: 1024, 7303 — TERMINAL NUMBERS

LINE NO. RU 38 — M. F. NO. 4906 — CABLE NO. — TERMINAL 32 RG, 508 BA, 530 OB — PAIR 24, 3, 6 LT 4057

LONG LINE PROTECTOR NO. — LONG LINE RELAY NO. — AUTOMATIC C. BATTERY MAGNETO — PINS

NUMBER	NAME		ADDRESS	EQUIPMENT
W 1	Weaver, W. A.	508-BA	NE 2-8-11	
W 2	Morgan, Geo. F.	530-OB	SE 6-8-11	290 R
W 3				
W 4	Weaver, Harold A.	32-RG	NW 1-8-11	
W 5				
J 1	Kroll, Fred	530-OB	NW 8-8-11	290 R
J 2				
J 3	Brickel, Vernon	32-RG	SE 1-8-11	290 R
J 4	Bockerman, Herman	530-OB	NE 8-8-11	220R-120R
J 5				

DATE	TIME REC'D	COMPLAINT NUMBER	COMPLAINT NATURE	Class	TEST V. M.	TEST TIME	TEST BY	Time Given Out	GIVEN TO	TROUBLE FOUND AND WORK DONE	TIME O. K.
4/7/50	2:17 p	2A	38 C B						K. H.	Short aerial - 4/20/50	10 00 a
5/5/50	2:01 p	Cant	busy		Cant	busy			K. H.	grd. aerial - 5/5/50	6 00 p
6/1/50	2:10 p		pt						G. F.	Replaced drama. 6/1/50	3 00 p

FIGURE TWENTY-SEVEN — This subscriber's card record form for smaller exchanges lists the same kind of information needed for rural party lines bridging at the main frame as that given in Figure 26.

assignment record are made with hard pencil to enable changes to be made readily as required. A softer grade of pencil will smudge the sheet and may render entries illegible.

Cross-Connecting Terminal Record

CROSS-CONNECTING terminals are actually aerial main distributing frames which enable rearrangement of vacant pairs in a feeder cable for better distribution of the pairs in the laterals connected to the feeder cable. Cross-connecting terminals require separate cable record sheets for listing the terminals and their pair numbers associated with the aerial pairs. This information is not shown in the main cable record, which lists only the terminals to which the associated underground pairs connect through risers.

The record sheets for each cross-connecting terminal are located in the back of the same cable binder containing information on the cross-connecting terminals in the main record. Each page of these record sheets is numbered in consecutive order following the last page of the

Please Turn To Page 75

Cable Plant Construction

Questions on Part II—Cable Records; Numbering Scheme Used in Cable Records, Maps, and Associated Forms; Numbering Scheme for Cable Terminals; Cable Record Book; Terminal Feed Record; Cable Record Entries on Assignment Side; Terminal Exposure Section of Cable Record; Recording Use of Spare Pairs; Main Frame Number Entries — Cross Connecting Terminal Pairs; Class of Service — Subscriber's Telephone Numbers; Cross-Connecting Terminal Record.

(1) Why are cable records needed?

(2) Describe the numbering systems used to designate cable pair and office pair terminations. What numbering method is used when a line intermediate distributing frame is involved?

(3) What numbering systems are employed to designate terminal locations?

(4) What information would you find in the cable record?

(5) How is the terminal feed record employed?

(6) How are pair terminations in the outside cable terminals designated, and how are they entered in the cable record? What are page code numbers?

(7) What is the advantage of using a color code system in listing cable pairs in multiple on the cable record? Would this method be necessary in an exchange operating on a terminal-per-station basis? Why?

(8) How are spare pairs handled in the cable record? What would be the advantage in not having them in the terminal exposure section of the record along with the regular pairs?

(9) Why is it necessary to use the subscriber's card record with the cable record?

(10) What is the purpose of a cross-connecting terminal record?

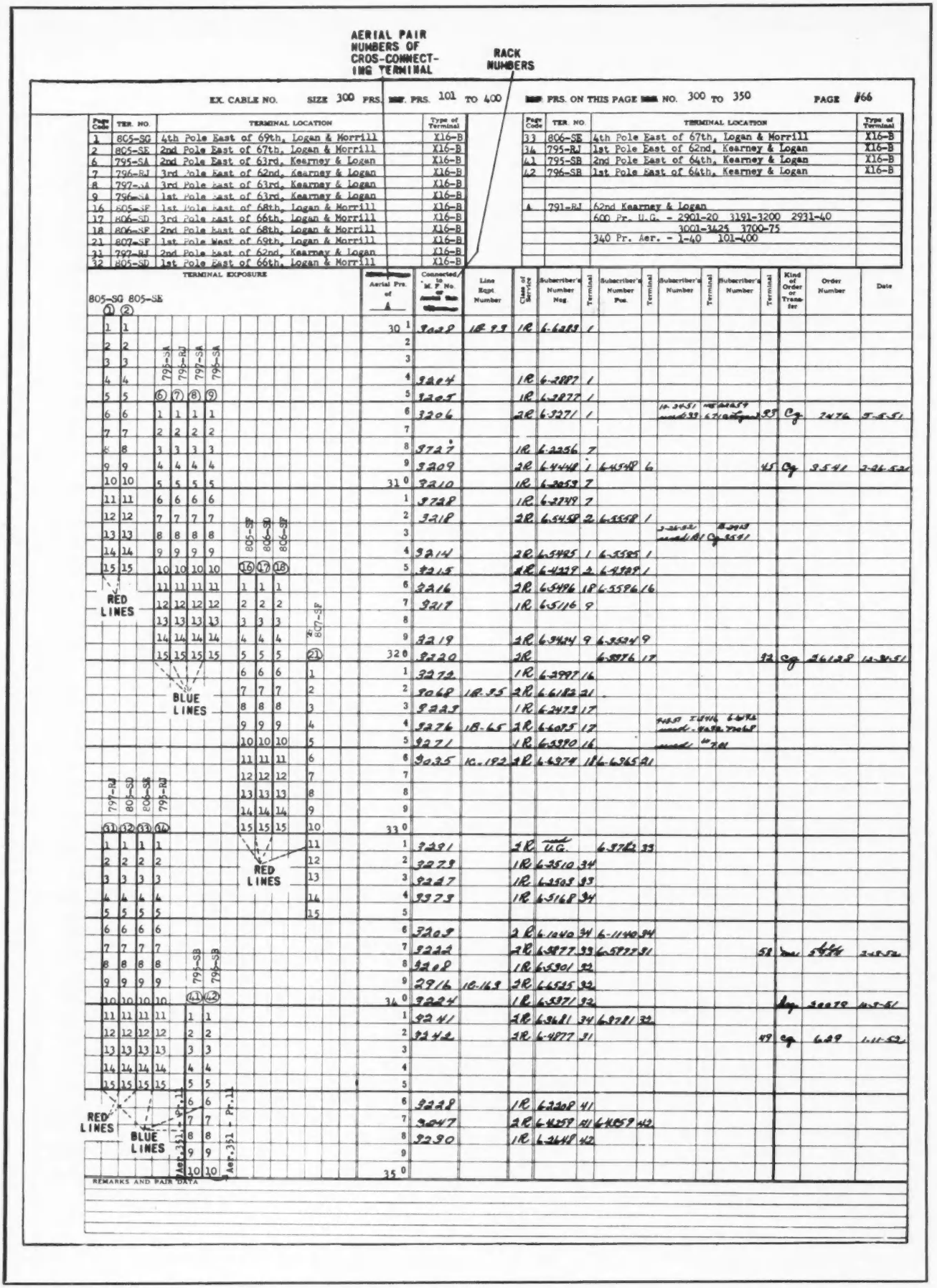

AERIAL PAIR NUMBERS OF CROSS-CONNECTING TERMINAL
RACK NUMBERS
EX. CABLE NO. SIZE 300 PRS. BEF. PRS. 101 TO 400
PRS. ON THIS PAGE NO. 300 TO 350
PAGE #66
Page Code | TER. NO. | TERMINAL LOCATION | Type of Terminal
1 | 805-SG | 4th Pole East of 69th, Logan & Morrill | X16-B
2 | 805-SE | 2nd Pole East of 67th, Logan & Morrill | X16-B
6 | 795-SA | 2nd Pole East of 63rd, Kearney & Logan | X16-B
7 | 796-RJ | 3rd Pole East of 62nd, Kearney & Logan | X16-B
8 | 797-SA | 3rd Pole East of 63rd, Kearney & Logan | X16-B
9 | 796-SA | 1st Pole East of 63rd, Kearney & Logan | X16-B
16 | 805-SF | 1st Pole East of 68th, Logan & Morrill | X16-B
17 | 806-SD | 3rd Pole East of 66th, Logan & Morrill | X16-B
18 | 806-SF | 2nd Pole East of 68th, Logan & Morrill | X16-B
21 | 807-SF | 1st Pole West of 69th, Logan & Morrill | X16-B
31 | 797-RJ | 2nd Pole East of 62nd, Kearney & Logan | X16-B
32 | 805-SD | 1st Pole East of 66th, Logan & Morrill | X16-B
33 | 806-SE | 4th Pole East of 67th, Logan & Morrill | X16-B
34 | 795-RJ | 1st Pole East of 62nd, Kearney & Logan | X16-B
41 | 795-SB | 2nd Pole East of 64th, Kearney & Logan | X16-B
42 | 796-SB | 1st Pole East of 64th, Kearney & Logan | X16-B
A | 791-RJ | 62nd Kearney & Logan
600 Pr. U.G. - 2901-20 3191-3200 2931-40
3001-3425 3700-75
340 Pr. Aer. - 1-40 101-400
TERMINAL EXPOSURE
805-SG 805-SE
795-SA 795-RJ 797-SA 796-SA
805-SF 806-SD 806-SF
RED LINES
BLUE LINES
795-RJ 805-SD 806-SE 795-RJ
RED LINES
795-SB 795-SB
RED LINES
BLUE LINES
Aer. 351 + Pr. 11
Aer. 351 + Pr. 11
Aerial Pr. of A
Connected to M. F. No. of Aerial Terminal
Line Equipment Number
Class of Service
Subscriber's Number Neg.
Terminal
Subscriber's Number Pos.
Terminal
Subscriber's Number
Terminal
Subscriber's Number
Terminal
Kind of Order or Transfer
Order Number
Date
REMARKS AND PAIR DATA

FIGURE TWENTY-EIGHT — The cross-connecting terminal record sheet shows information on associated underground and aerial cable pairs and other terminals on the aerial pairs.

main cable record in the cable book. The terminal feed record gives the proper page number to locate the aerial pair terminal that feeds to a subscriber's number.

The method of entering all related information on the cross-connecting terminal sheet is the same as for the main cable record, with differences as noted in Figure 28.

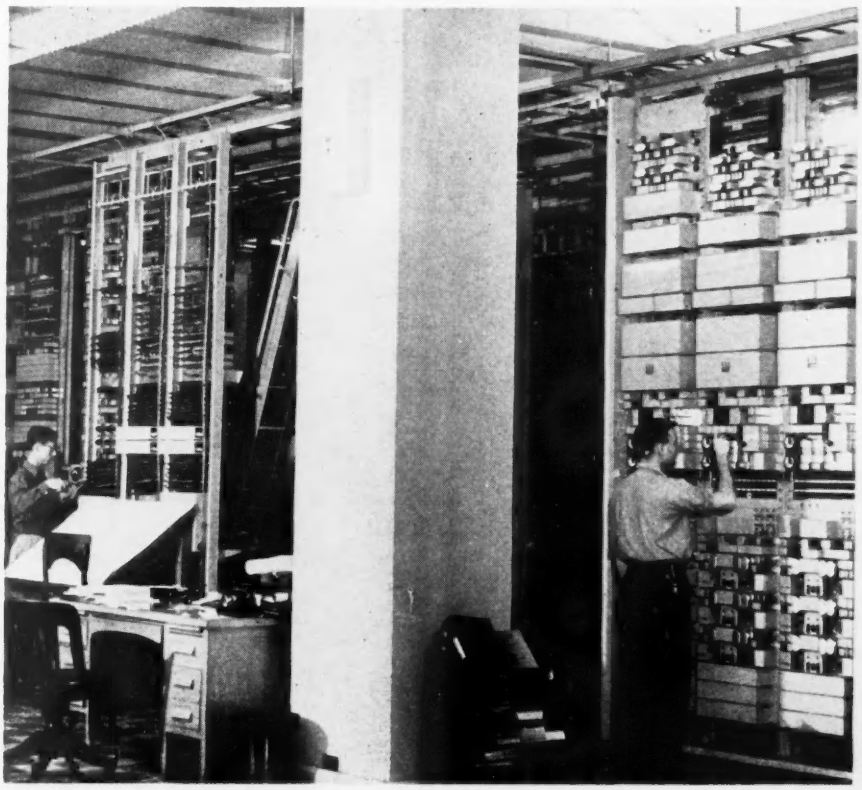
At the top of the page, the size of the aerial cable and the aerial pair numbers are shown. In the terminal location boxes, the page code numbers, terminal numbers, terminal locations, and types of terminals are listed for the aerial pairs on the page. This same information is given on the cross-connecting terminal in this section, except that its size in number of pairs is indicated under "Type of Terminal." The rack numbers associated with the aerial pairs also are shown with the cross-connecting terminal data. This information is used in referring to the main record from the cross-connecting terminal record.

The aerial pairs are listed in the column headed, "M. F. No. or Aerial Pairs of ....." in consecutive order, beginning with "1" and continuing to the last number of the aerial pair group on the last page in the cross-connecting terminal record. The rack number associated with the aerial pairs are entered in the column under "Connected to M. F. or Aerial Pairs of ....." The rack number assignment is obtained from the main cable record, and the corresponding U. G. pair and aerial pair are jumpered together in the cross-connecting terminal.

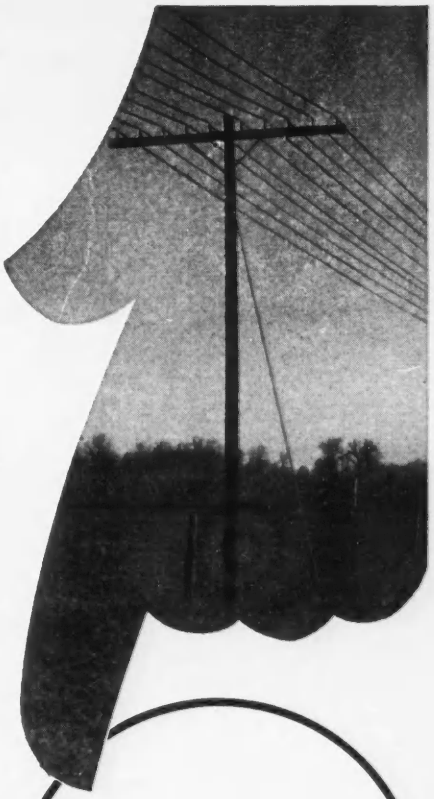
In the terminal exposure section, the terminal pair numbers are entered in the same order as the aerial pair numbers. The pair numbers of terminals in the same multiple will be found on the same horizontal line with the associated aerial pair number.

The line equipment numbers (when required), subscribers' numbers, and assignment record information are entered in the proper columns, on the same line with the associated rack and aerial pair numbers. The page code number associated with the subscriber's number designates the terminal on the aerial pair that feeds to the subscriber's number.

Information relating to cable development in the area covered by the aerial pairs from the cross-connecting terminal is entered on the cable development side of the associated record sheet in the cross-connecting terminal record. *To Be Continued.*



DALE WELLS, left, and R. L. HIBBERT check equipment used for inter-toll dialing. Serving Lincoln and 124 other cities in southeast Nebraska, this inter-toll equipment occupies a major part of the first floor of the building.



Crapo
HTL-135
INDIANA STEEL & WIRE CO.
MUNCIE, INDIANA U. S. A.

LOWER
Cost Per Mile

● Efficient rural telephone circuits can be built at minimum overall cost where Crapo HTL-135 High-Tensile Line Wire is used to full advantage. For Crapo HTL-135 makes possible spans up to 350 feet in heavy, 540 feet in medium and 650 feet in light loading districts. Longer spans mean fewer pole structures with substantial savings in material and labor costs per mile.

The rugged tensile strength of Crapo HTL-135 and its heavy galvanized coating provide dependable and economical service life on typical rural lines.

Ask your jobber for details or write direct for engineering data!

INDIANA
STEEL & WIRE COMPANY
Muncie, Indiana

Industry members enthusiastically approve proposed National Advertising Program.

U-S-I-T-A Reports On—

National Advertising Program

THE PROPOSED National Advertising Program for the Independent telephone industry moved into high gear last month with, more than 52 per cent of the manufacturers and suppliers, and approximately 73 per cent of the Independent operating companies enthusiastically approving the plan by sending in their assessments or indicating when the remittances would be made.

As an indication of the enthusiasm with which the Independent telephone industry advertising program has been greeted by telephone companies and their manufacturers and suppliers alike, Clyde S. Bailey, executive vice president of the United States Independent Telephone Association (U-S-I-T-A) recently reported the following quotes from various letters received at U-S-I-TA's Washington office:

"I believe this is a very worthwhile program and I am glad to be able to support it." . . . "We feel that this advertising is a good idea." . . . "Had such a program been started only two years ago it could have discouraged most of the untrue statements made by those seeking to promote unsound socialized ventures . . . It's time we in the Independent industry tell our story of progress — our capabilities, our willingness and ability to serve the 11,000 cities, towns and villages in which we operate" . . . "I believe this is a very fine program." . . . "This advertising program you have laid out looks good." . . . "I think your committee has done a fine job." "May success crown your efforts."

Objectives of The Advertising Program

THE NATIONAL advertising program, prepared by the well-known New York Mathes Advertising Agency under the auspices of the U-S-I-T-A Advertising Task Force, and approved by the association's Board of Directors is designed to accomplish the following objectives:

(1) Bring home to the American people information of the fact of existence of an Independent telephone industry, with its own manufacturers, suppliers, directory publishers, trade press and related services.

(2) Acquaint the American people with the extent of the industry in terms of communities served, stations in service, plant investment, stockholders and employes.

(3) Let the American people know what the accomplishments of Independent companies have been and what their service objectives are for the future.

(4) Acquaint the public with the fact that Independent companies and their manufacturers are responsible for the development of numerous significant improvements in the communications art — such as the dial telephone, the telephone handset, selective ringing, city-to-city long distance dialing, neoprene jacketed drop wire.

(5) Improve the morale of Independent telephone employes by giving them a sense of belonging — of being important parts of an essential industry whose existence is nationally known and respected.

(6) Acquaint the public with the fact that the Independent telephone industry has reached its present development under tenets of Free Enterprise in a free economy in the finest American tradition.

(7) Acquaint the American people with the fact that the indomitable spirit which has inspired and motivated the industry up to now will continue, and that this spirit will make it unnecessary to resort to socialistic or semi-socialistic ventures at the expense of the over-burdened taxpayer.

(8) Stress the need for realistic treatment and sympathetic public understanding of the revenue needs of a regulated business in order that it may continue to attract necessary investor capital.

(9) Uncover and develop new sources of capital for expansion and improvement of telephone service — whether it be the small town banker, the small town investor, and insurance company or any other financial source.

(10) Reemphasize that the Independent telephone companies are an

Industry Members Approve New Advertising Program

"This program has impressed me most favorably. I believe it will be well worth its cost to the Independent Industry if sufficient companies join together to make it successful. It should be of value to the small as well as the larger companies. — ***Carl D. Brorein, president and General Manager, Peninsular Telephone Co., Tampa, Fla., and Chairman, USITA Advertising Task Force.***

"A sound, well-conceived program. National advertising of this sort should prove helpful to the Industry at all levels. I'm for it." — ***Donald C. Power, president, General Telephone Corp., and Advertising Task Force member.***

indispensable part of the national telephone network and that without them and the service they provide the network would not be complete.

Mechanics of The Advertising Program

TO ACCOMPLISH the above mentioned objectives the U-S-I-T-A Board has authorized the Special Advertising Committee to contact U-S-I-T-A members to obtain the financial support necessary to carry the National Institutional Advertising Program through at a cost of $250,000 on an *annual basis.*

It is estimated that operating telephone companies representing not less than 5,000,000 stations should participate at 3 cents per station, and Industry manufacturers and suppliers and all other non-operating-telephone firms (except holding companies) having membership in the association should consider participation to the extent of $75,000, the amount to be apportioned in proportion to the dues now paid by these companies for membership in the association. The balance can then be provided from special funds which the association has at its disposal.

Within the framework of the program's broad objectives, the Independent telephone industry has several newsworthy facts to relate:

(1) There are 5,300 Independent telephone companies.

(2) They serve 9,125,000 telephones.

(3) They are located in 11,000 communities — more than half the number of telephone communities in the U.S.A.

(4) They comprise a 1½ billion dollar industry.

(5) The industry's gross plant investment has more than doubled in the last 10 years — and every other major growth factor has nearly doubled.

(6) Without the lines of Independents, our nation's long distance service could not exist as we know it.

These are the facts that are most interesting — and surprising — to the people approached in recent copy-testing interviews, and they are emphasized in the advertisements prepared by the agency.

It has been decided that the Independent telephone industry story should be aimed at that segment of the population *in the best position to act on the advertising*: the investor — large and small; the businessman; the farmer; the medium to upper income groups; the college-educated groups; the leaders in thought who guide public opinion; the executives of today and tomorrow — young and old alike.

The Special Advertising Committee has chosen three magazines to do the job.

Together these publications reach nearly 5 million per issue of the people who, with a greater knowledge of the Independent Telephone Industry, can do the most good for Independent operating companies.

In all, the Independent telephone industry story will be told a total of 41,975,000 times in every part of the country via the three magazines.

Each advertisement in the program, with the exception of the first, will bear a chart of some major growth factor. Likewise, each manufacturer of telephone instruments for the Independent industry will have his particular set pictured and identified once in the course of the program. Headlines will be straightforward and informative. Text will continually hammer at the most newsworthy facts and figures about the industry.

Subjects for additional advertisements include: —

(1) Geographical spread of Independent telephone companies serving the U.S.A

(2) Independents serve more U.S. communities than any other telephone group.

(3) Independents are big enough for leadership . . . never too big for friendship.

(4) Independents now make up a 1½ billion dollar industry — doubled in size in last 10 years.

(5) Statistical sketch of an average day in the Independent telephone industry.

(6) Role of Independents in nationwide long distance service.

(7) How does U-S-I-T-A and the Independent industry benefit the average U.S. citizen?

(8) The Independent telephone company was first to use dial telephone system over 60 years ago.

(9) Independent telephone company investment story — for both large and small investor.

(10) Independents' modernization aims and accomplishments.

(11) Independent service to the farmer.

(12) Role of Independents in industrial decentralization.

(13) Career opportunities offered by Independents.

(14) Story of Independent manufacturers and suppliers.

Independents Supporting Proposed Program

TO DATE the proposed national advertising program has been enthusiastically received. If this constructive undertaking is supported generally, Independent telephone companies and their manufacturers and suppliers before long will find their existence nationally recognized, their merits extolled and their problems explained in well prepared advertisements appearing in respected magazines and other periodicals of general circulation.

On January 28, Mr. Bailey reported that — "Assessment payments have continued to come in in a pretty encouraging manner."

Industry members desiring more information on the Advertising Program may write to Clyde S. Bailey, executive vice president, United States Independent Telephone Association, 411-417 Munsey Building, Washington 4, D.C. Or you may give the program your individual approval by sending in your assessment now, or indicating the time you will make remittance. Check should be drawn to "Special Advertising Fund, U-S-I-T-A." Checks should be sent to the United States Independent Telephone Association, 411-417 Munsey Bldg., Washington 4, D.C.— THE END.

"Spellbinders"

"All too many of the American people, temporarily it is fervently hoped, have been dazed by the spellbinding proponents of the Government-Owns-You system. It is high time for these citizens to sit down and calmly . . . ask themselves if they really wish to subject themselves to the tyranny of a bureaucratic system..."—Neligh (Neb.) Leader.

TELEPHONE ENGINEER & MANAGEMENT'S

HANDBOOK DATA SHEETS

Prepared By

JOHN S. REED

Self Supporting Ankoseal Telephone Cable Type 775-P-SS

Index 4-46-002
Aerial Cable, Self Supporting
Page 3, Feb. 15, 1954

Table IV—Sag and Tension Data—No Load and Full Load Characteristics Self-Supporting Ankoseal Telephone Cable—16 Pair, No. 19 AWG Type 775-P-SS (Based on Ansonia Data Sheet SS-1601)

	Heavy Loading District				Medium Loading District				Light Loading District			
	No Ice or Wind 60°F		½" Ice—4# Wind 0°F		No Ice or Wind 60°F		¼" Ice—4# Wind 15°F		No Ice or Wind 60°F		No Ice—9# Wind 30°F	
Span Length in Feet	Sag in Feet	Tension in Pounds	Sag in Feet	Tension in Pounds	Sag in Feet	Tension in Pounds	Sag in Feet	Tension in Pounds	Sag in Feet	Tension in Pounds	Sag in Feet	Tension in Pounds
100	0.68	432	1.68	1057	0.68	432	1.30	835	0.68	432	1.10	680
125	1.07	432	2.42	1150	1.07	432	1.93	882	1.07	432	1.63	719
150	1.66	399	3.31	1210	1.54	432	2.61	938	1.54	432	2.23	754
175	2.74	330	4.49	1210	2.09	432	3.39	983	2.09	432	2.95	778
200	4.14	285	5.90	1210	2.73	432	4.24	1027	2.73	432	3.72	804
225	5.66	264	7.48	1210	3.46	432	5.17	1068	3.46	432	4.57	828
250	7.48	248	9.27	1210	4.27	432	6.18	1105	4.27	432	5.51	852
275	9.38	239	11.2	1210	5.18	432	7.28	1138	5.18	432	6.52	873
300	11.7	299	13.4	1210	6.14	432	8.43	1168	6.14	432	7.59	894
325	14.1	224	15.9	1210	7.20	432	9.62	1200	7.20	432	8.72	913
350	16.7	220	18.5	1210	8.57	422	11.1	1210	8.37	432	10.0	922
375	19.5	217	21.2	1210	10.2	408	12.7	1210	9.64	432	11.4	935
400					12.0	396	14.5	1210	10.9	432	12.7	948
425					13.9	387	16.4	1210	12.4	432	14.2	962
450					15.9	379	18.5	1210	13.9	432	15.8	969
475					18.0	372	20.6	1210	15.6	432	17.5	980

Copyright 1953 by The Ansonia Wire & Cable Company — All Rights Reserved

Table V—Sag and Tension Data—No Load and Full Load Characteristics Self Supporting Ankoseal Telephone Cable—26Pair, No. 19 AWG Type 775-P-SS (Based on Ansonia Data Sheet SS-2601)

	Heavy Loading District				Medium Loading District				Light Loading District			
	No Ice or Wind 60°F		½" Ice—4# Wind 0°F		No Ice or Wind 60°F		¼"Ice—4# Wind 15°F		No Ice or Wind 60°F		No Ice or Wind 30°F	
Span Length in Feet	Sag in Feet	Tension in Pounds	Sag in Feet	Tension in Pounds	Sag in Feet	Tension in Pounds	Sag in Feet	Tension in Pounds	Sag in Feet	Tension in Pounds	Sag in Feet	Tension in Pounds
100	.61	702	1.31	1502	.61	702	1.01	1225	.61	702	.85	1042
125	.94	702	1.92	1603	.94	702	1.52	1280	.94	702	1.30	1066
150	1.36	702	2.61	1695	1.36	702	2.09	1338	1.36	702	1.80	1107
175	1.85	702	3.38	1785	1.85	702	2.76	1378	1.85	702	2.39	1134
200	2.42	702	4.22	1870	2.42	702	3.50	1422	2.42	702	3.07	1155
225	3.07	702	5.13	1945	3.07	702	4.28	1468	3.07	702	3.81	1180
250	4.07	653	6.27	1966	3.79	702	5.17	1510	3.79	702	4.62	1200
275	5.38	598	7.62	1966	4.58	702	6.08	1552	4.58	702	5.49	1222
300	6.81	561	9.08	1966	5.45	702	7.11	1577	5.45	702	6.46	1240
325	8.34	540	10.6	1966	6.40	702	8.17	1610	6.40	702	7.45	1260
350	10.1	518	12.4	1966	7.43	702	9.32	1640	7.43	702	8.53	1277
375	12.0	503	14.2	1966	8.54	702	10.5	1675	8.54	702	9.66	1295
400					9.70	702	11.8	1700	9.70	702	10.9	1310
425					11.0	702	13.2	1720	11.0	702	12.2	1320
450					12.3	702	14.6	1742	12.3	702	13.6	1335
475					13.8	702	16.0	1765	13.8	702	14.7	1340

Copyright 1953 by The Ansonia Wire & Cable Company — All Rights Reserved

TELEPHONE ENGINEER & MANAGEMENT'S

HANDBOOK DATA SHEETS

Prepared By

JOHN S. REED

Selection of Span Lengths

Index 4-46.02
Aerial Cable Self Supporting
Page 4, Feb. 15, 1954

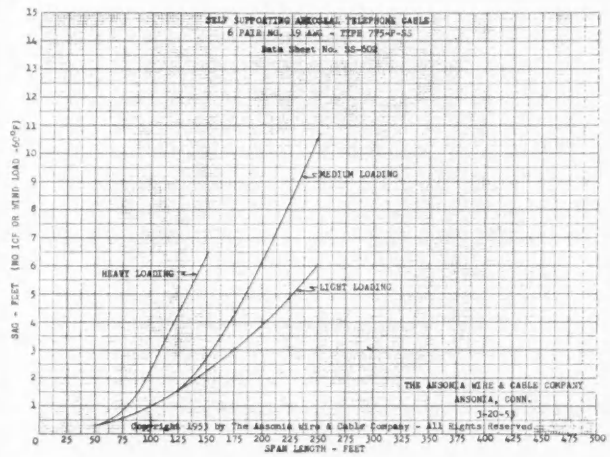

SELF SUPPORTING ANKOSEAL TELEPHONE CABLE
6 PAIR NO. 19 AWG - TYPE 775-P-SS
Data Sheet No. SS-502
MEDIUM LOADING
HEAVY LOADING
LIGHT LOADING
THE ANSONIA WIRE & CABLE COMPANY
ANSONIA, CONN.
3-20-53
Copyright 1953 by The Ansonia Wire & Cable Company - All Rights Reserved
SAG - FEET (NO ICE OR WIND LOAD -60°F)
SPAN LENGTH - FEET

FIGURE ONE — Determining span lengths under various conditions of loading, 6 pair, No. 19 AWG, Type 775-P-SS self supporting Ankoseal telephone cable.

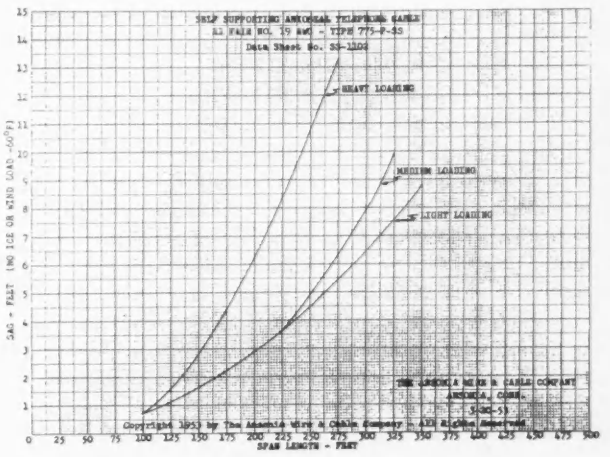

SELF SUPPORTING ANKOSEAL TELEPHONE CABLE
11 PAIR NO. 19 AWG - TYPE 775-P-SS
Data Sheet No. SS-1104
HEAVY LOADING
MEDIUM LOADING
LIGHT LOADING
THE ANSONIA WIRE & CABLE COMPANY
ANSONIA, CONN.
3-20-53
Copyright 1953 by The Ansonia Wire & Cable Company - All Rights Reserved
SAG - FEET (NO ICE OR WIND LOAD -60°F)
SPAN LENGTH - FEET

FIGURE TWO — Determining span lengths under various conditions of loading, 11 pair, No. 19 AWG, Type 775-P-SS, self supporting Ankoseal telephone cable.

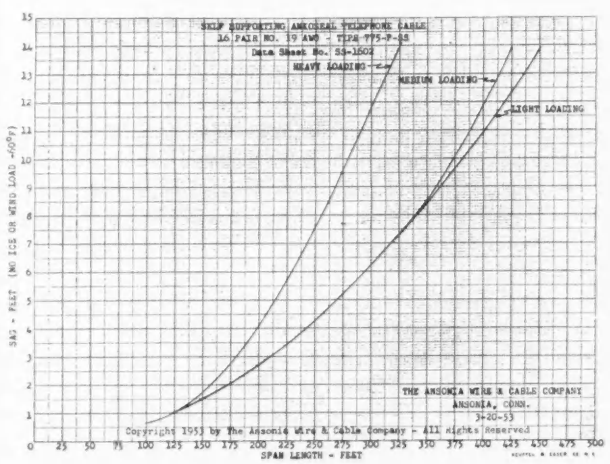

SELF SUPPORTING ANKOSEAL TELEPHONE CABLE
16 PAIR NO. 19 AWG - TYPE 775-P-SS
Data Sheet No. SS-1602
HEAVY LOADING
MEDIUM LOADING
LIGHT LOADING
THE ANSONIA WIRE & CABLE COMPANY
ANSONIA, CONN.
3-20-53
Copyright 1953 by The Ansonia Wire & Cable Company - All Rights Reserved
SAG - FEET (NO ICE OR WIND LOAD -60°F)
SPAN LENGTH - FEET

FIGURE THREE — Determining span lengths under various conditions of loading, 16 pair, No. 19 AWG, Type 775-P-SS self supporting Ankoseal telephone cable.

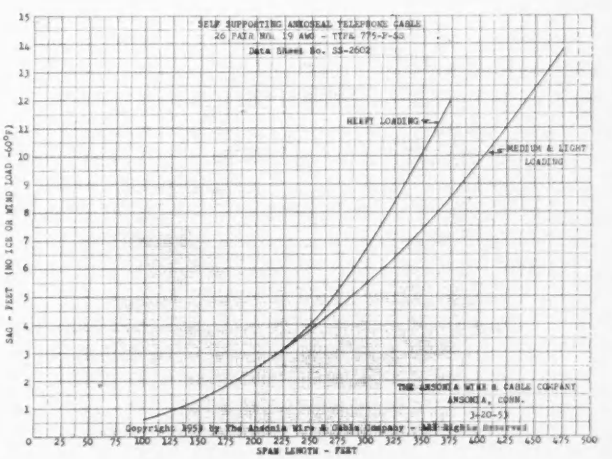

SELF SUPPORTING ANKOSEAL TELEPHONE CABLE
26 PAIR NO. 19 AWG - TYPE 775-P-SS
Data Sheet No. SS-2602
HEAVY LOADING
MEDIUM & LIGHT LOADING
THE ANSONIA WIRE & CABLE COMPANY
ANSONIA, CONN.
3-20-53
Copyright 1953 by The Ansonia Wire & Cable Company - All Rights Reserved
SAG - FEET (NO ICE OR WIND LOAD -60°F)
SPAN LENGTH - FEET

FIGURE FOUR — Determining span lengths under various conditions of loading, 26 pair No. 19 AWG, Type 770-P-SS, self supporting Ankoseal telephone cable.

A Major League Job In Safety

Continued From Page 53

reached San Francisco before the last vehicle had left New York City. In fact, in our quarter of the United States, it requires over 2,300 vehicles, costing us well over $2,495,000 a year to operate. Perhaps only a traveling salesman would drive as many as 20,000 miles in a year. It would, however, take a trailer to carry the extra three figures — the actual 20 million miles which this 2,300 motor vehicle fleet drove last year — the equivalent of 800 times around the equator. This means an average of over 9,000 miles per vehicle which is well above that for the average civilian driver.

The outstanding feature of all of this, however, is that our drivers established a record of 185,000 miles per motor vehicle accident for which they could be held responsible.

A slogan in all of our garages in New Mexico-El Paso states: "*A telephone truck never has the right of way*"; and still another one, "*Let's be courteous, it's fun.*" It is this type of thinking that led New Mexico-El Paso to two safety awards in successive years.

Most people don't drive. They just aim their cars. Driving an automobile in this day and age, even in fair weather, is a major adventure. For our boys who drive in all kinds of weather, day in and day out, and establish a driving record such as has been done, we believe they have accomplished A Major League Job in a Major League Area. I have in mind a construction supervisor working in a mountain section of one of our states who has driven 530,000 miles in 10 years without an accident. Tangible evidence of a major league job in driving.

Perhaps we ask ourselves why we have so much difficulty in interesting the public in highway safety. Why is it that we can get ourselves all steamed up about the polio epidemic which for example, in our state of Colorado involved 65 cases while in the same period there were 175 deaths upon our streets and highways, a story which is repeated over and over again in the nation as a whole. We must find a way to create safety consciousness on our highways. More safety education in our schools, more of a planned program in which industries, such as the utilities represented here, can take a leading part. Perhaps our approach in the past has been too many negatives.

When our program was started in 1921, we had 73.2 lost time accidents per one thousand male employes. This meant that over 73 out of every thousand employes received some injury during the year so severe that they could not return to work the next day. This is the year when our safety program was seriously initiated and by 1930, as indicated on the chart, we had reduced the lost time accidents to 24.7. By 1940 we had made a further reduction to 6.6 per thousand employes. In 1950 we reached the all-time low, achieving the remarkable results of only 1.54 or slightly over 1-½ injuries per thousand male Plant employes which were serious enough to keep the employe off the job the next day. In 1951 we had a slight increase and there were 2.11 injuries per thousand male employes. In 1952 we had 2.08 injuries per thousand male employes.

The men of the plant department, through their safety program, have made this one of the safest possible industries in which to work. In the past this department was roughly three times as safe, by facts and figures, as the jobs of our clerical and switchboard operation, etc. In 1952 safety programs were placed in effect in these other departments and now their accident ratio is comparable to the plant department. Conclusive evidence of what a safety program can do.

As a result of this safety program and an accident prevention conscious force, we have presented retirement pins to craftsmen with 52 and 51 years of service, men who had spent their lives in line and craft work and yet had never had an on-the-job accident. We have a district spanning a severe winter and mountain snow belt in southern Utah that has never had a lost-time accident in its history of over 16 years.

Today in the expanding business and the rush of our times we find executives inclined more and more to be guided in the operation of their business by charts and tables, primarily because the businesses have grown

Construction
With the Double
and America's
gould planté . . .
the aristocrat of stationary batteries

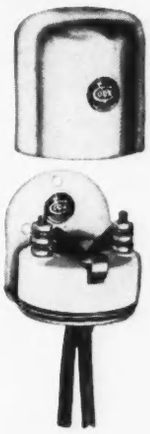
Many Planté batteries are still in active full-float service after twenty, thirty, even forty years! That's because Planté plates are heavy, solid sheets of pure lead. In these batteries Gould has eliminated the primary cause of self-discharge, capacity losses and shortened battery life. Cut maintenance, charging and replacement costs to a minimum. Choose Planté.
Made by
GOULD-NATIONAL BATTERIES INC
STROMBERG Telephone CARLSON
TELEPHONES, SWITCHBOARDS • SOUN

tion Materials and Supplies . . .

uble Guarantee of Stromberg-Carlson ica's Leading Manufacturers . . .

re-designed with new improvements . . .

cook testerm drop wire connector



Built of lighter alloys, the new Cook Testerm Drop Wire Connector provides better insulation, reduces shipping costs, simplifies installation, occupies less space and further improves the connecting methods of subscriber drops to open wire.

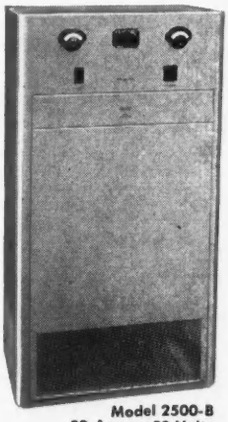
Overall dimensions of the unit have been reduced but the spacing between the conductors is the same as the original design.

The base and cover are detachable from the mounting bracket by a bayonet locking arrangement of three Everdur studs that are "upset" to prevent loss of nuts during installation. These nuts fit the standard socket wrench. Wire entrances are sealed by a Neoprene gasket to prevent the entrance of insects, dirt and moisture.

The new Testerm Drop Wire Connector Part No. 563-30 supercedes Part No. 563-1

for 3-phase operation . . . be safer and surer with

flotrol automatic battery charger



Model 2500-B 50 Amps., 50 Volts

Except for the starting and battery disconnect contactors, the FLOTROL does not contain any moving parts—an assurance of higher efficiency, complete dependability and longer service life. All components are in one cabinet and no special foundations are needed, reducing installation to a minimum. DC voltage delivered is regulated within ± 1%. Complete overload protection is as automatic as charging itself.

WRITE for Bulletin 161—completely describing the FLOTROL system for 3-phase operation.

·ANSONIA· Ankoseal

the modern, all-plastic, lightweight telephone cable . . .

saves three ways—

1. Lower first cost
2. Lower installed cost
3. Lower maintenance cost

Available for aerial, duct and direct burial use. For complete information contact your nearest Stromberg-Carlson Field Office.

THE ANSONIA WIRE & CABLE COMPANY

Distributed by STROMBERG-CARLSON

ROCHESTER · CHICAGO · ATLANTA · KANSAS CITY · SAN FRANCISCO · TORONTO

· SOUND EQUIPMENT AND ELECTRONIC CARILLONS · INDUSTRIAL INTERCOMMUNICATION SYSTEMS · TELEVISION, RADIOS AND RADIO-PHONOGRAPHS

WORK GOES
FASTER, EASIER
with SEYMOUR SMITH tools

The choice of tree men for generations

No. 11
Pruner Head

Center Cut Action

"TELEPHONE" TREE PRUNERS

The very finest of tree pruners! Virtually unbreakable heads, selected spruce poles with positive locking, seamless aluminum joints. Simple, powerful action. No. 11-18, 1" capacity, $16.00. No. 12-18, complete pruner, 1½" capacity, with 18 foot pole, $24.75. Extension sections available.

POLE PRUNING SAW

No. 20 SAW HEAD
Hand only $4.20
with 18 ft. pole $16.00

16" needle-tooth saw blade fits in 3 different positions. Extra large hook for pulling out loose branches. Paint brush holder.

LOPPING SHEARS

6 models to choose from. Cut up to 2" branches with ease.

NEW, FINEST EVER
PRUNING SAWS

A new Seymour Smith development — the fastest, easiest cutters on the market. Complete line of 6 models covering all requirements up to chain saw work.

FREE: Send for full descriptive matter and prices on all Seymour Smith products for professional pruning and tree care.

SEYMOUR SMITH
OUR 104th YEAR
The Line of Quality
SEYMOUR SMITH & SON, INC.,
42502 Main St., Oakville, Conn.

so large that they may have found this desirable. Most charts represent the past. They were drawn yesterday and represent yesterday's conditions. Today we are actually producing the results which will show up on the next month's charts. Few charts show the future.

"People Are the Essence Of Safety"

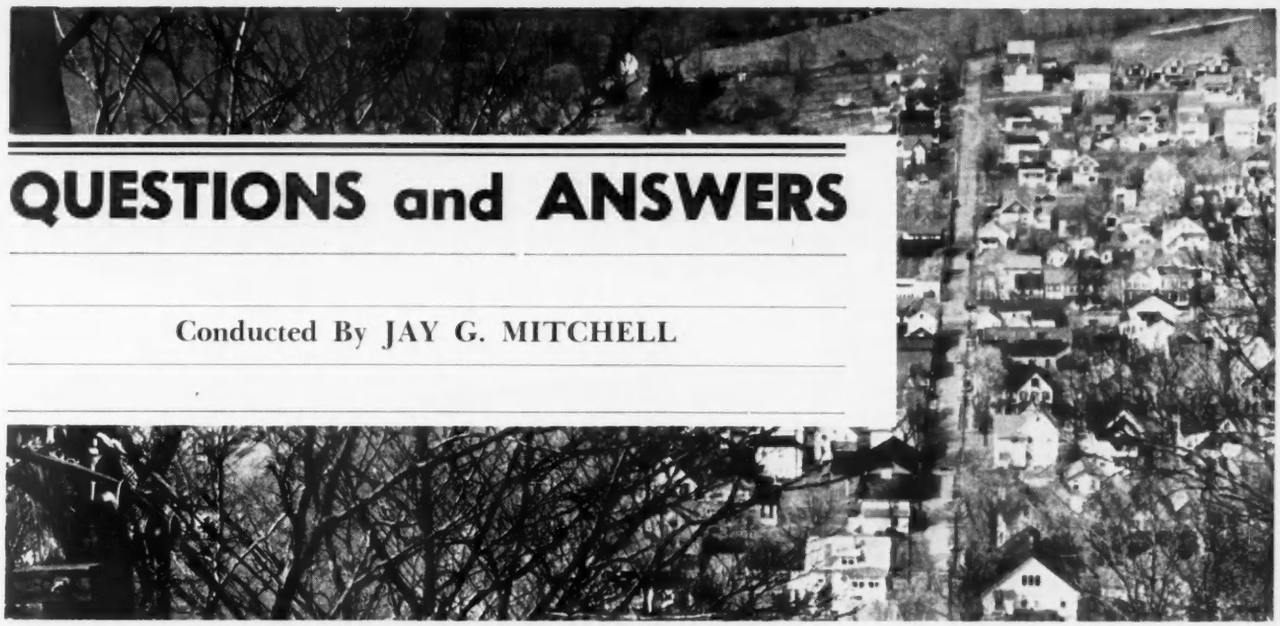
PERHAPS ONE of the problems in safety and one of the problems in industry today is how to return to the old philosophy that we applied when our organizations were smaller, when we knew the conditions and the people who met those conditions without consulting charts. If we look back of charts to see what makes the job we find *people*, men and women, people who produce the results today that someone will chart tomorrow. The more we concern ourselves with the people doing the job, the more we work with them, the less we will have to work with charts on yesterday's job. Safety charts do not make us safe. It's the attitude inside the employe which creates safety. Let's keep in mind that charts are only tools, that people are the essence of safety. Let's know our people, sell them on safety and we can forget the charts. Safety is something personal that cannot possibly be represented by any bulletin or chart.

Another of our successful safety slogans is:

SAFETY *depends on prevention*
Prevention DEPENDS *on observation*
Observation depends ON *action*
Action depends on YOU

No one else can think for you and no one else can act for you in that split second to avoid an accident. When that moment arrives, it's your final examination on safety. This is the pay off. There is no supervisor to direct you, no committee to call upon for suggestions. If, by habit, you do things the safe way, the odds are in your favor. This is the time when safe working habits and safe driving habits pay off in big dividends, where over the years they have been paying off for our plant boys in increasing dividends, making this one of the safest jobs in the whole of industry. — *This paper was presented at the* 1953 *convention of the National Safety Council.*

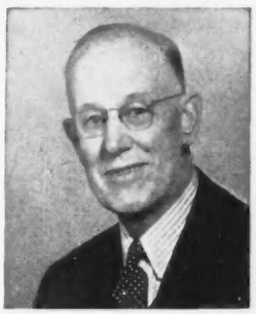
"John, we simply must get an extension phone!"



QUESTIONS and ANSWERS

Conducted By JAY G. MITCHELL

In this issue Mr. Mitchell discusses — (A) Impedance in Transmission Metering; (B) Decibels in Sound; (C) Selection of Cross Section Ruling for Graphs, and (D) An Extreme Case of Low Output in Dbm.



QUESTION:—*In developing our understanding of the Decibel Calibration by reading the series of articles that have been published in* TELEPHONE ENGINEER *we have encountered one definite condition that has us puzzled. Will you please comment on the following which seems, to us, to conform with the principles that have been set out but which does not check with the tables and graphs otherwise.*

We find that when we connect a source of direct current into a loop of 500 *ohms that the Decibel Calibration of our small tester indicates about* 0 *Decibels when the voltage at the loop terminals is carefully adjusted to about* 1.73. *In this respect the observed facts seem to be in reasonable agreement with the published table and graph. When we try to measure the transmission output of one of our toll circuits with the same instrument setup, however, the results are entirely out of line with what we think should be the result.*

For the 500 *ohm loop around which our tester is connected we are using one spool of a* 1,000 *ohm ringer which we have carefully measured and which is almost exactly* 500 *ohms in resistance. Probably the explanation of this apparent discrepancy is very simple but we have not been able to figure it out. Thank you.*

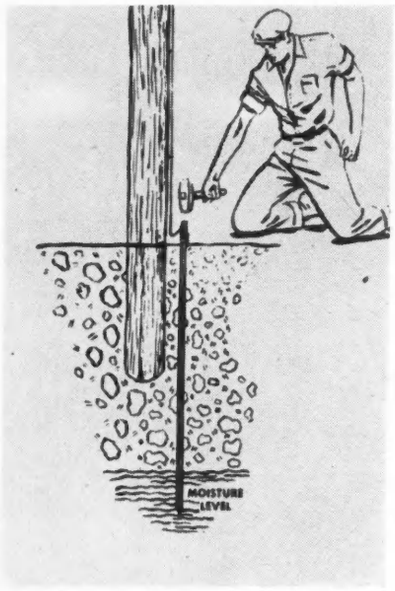
ANSWER: This inquiry is most welcome because it serves to bring out for emphasis one basic fundamental point which is very important to an understanding of the Decibel Calibration. If this correspondent should make some further tests with a source of *direct current* from, for example, a set of dry batteries applied to the terminals of his 500 ohm ringer spool it would be found that the results as to Decibels and Volts will check with the table and graph that has been published. However, and this is most important, the tremendous value of the Decibel Calibration in communication problems lies in one fact. This is that it affords a practical means of measuring the *power* of *alternating currents* of much higher frequency than power and light currents and of low wattage which is the characteristic of the voice carrying currents in communication plant and equipment. Because the 500 ohm ringer spool used for the measurement loop offers a much higher *impedance* to such comparatively high frequency alternating currents than it offers to direct current the Decibel readings obtained by its use are entirely out of line and are undoubtedly too high.

While both *impedance and resistance* are expressed in ohms they may be at wide variance for the same item of equipment. For illustration the 500 ohm ringer spool might have exactly, as stated, a resistence to direct current of 500 ohms while at the same time it had, under some conditions, an *impedance* to 1,000 cycle alternating current of 10,000 ohms. The Decibel Calibration of the multitester is based upon the effective voltage of the voice carrying alternating currents around a noninductive loop, to alternating current, of 500 ohms. In some instruments this loop impedance is 600 ohms but the same set of principles govern. The basic voice carrying alternating currents have frequencies which lie within the group of frequencies known as the Audio frequencies and this term is thought to be fairly definite for use in this connection in this way.

An *impedance* of 500 ohms at audio frequencies is somewhat difficult to obtain but, for ordinary practical purposes a *noninductive precision resistor* carefully handled and properly installed may be used for the loop in ordinary maintenance testing. The total impedance of the testing instrument must be sufficiently high, also, to eliminate any sub-

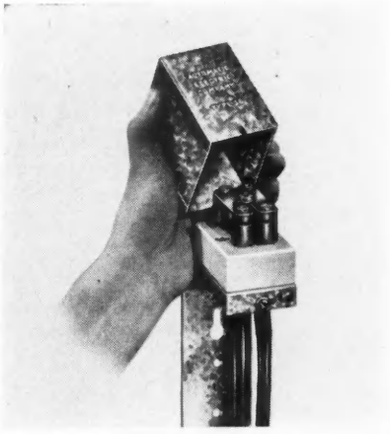
You may only think you're getting power-cross protection!

When a man installs a high-voltage arrester, he naturally assumes his lines will be securely protected against power-cross damage.
But he may only *think* so!



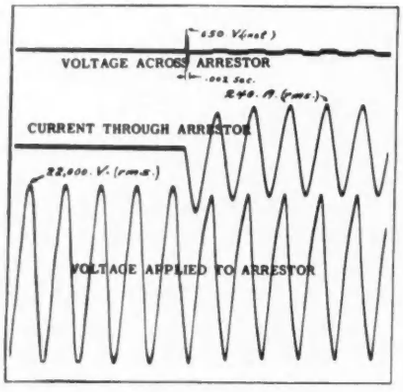
A low-resistance ground . . .

Unless he puts in a ground rod long enough to reach the moisture level, he's asking for trouble. Ditto, if the rod is too short to reach moisture during dry spells. For in either case there will be times when he has very little power cross protection. A look at the formula E = RI shows why. (E = voltage after arrester operates, R = ground resistance, and I = current.) In theory, a 12,000-volt cross at 400 amperes should be reduced to 50 volts for *complete* safety, and to do this, the ground resistance could not exceed ⅛-*ohm*. In practice, it would be considered acceptable to merely reduce the 12,000-volt charge to a point where nearby substation protectors could handle it, and to do this, ground resistance should not exceed 2.5 ohms.
Now, for the high-voltage arrester itself: choosing a good one is no problem. Leading the field is Automatic's Type 56, which is proving very dependable in service. It contains an exclusive bi-metallic plate that bends and grounds the line. After the current is



. . . plus Automatic's Type 56 High-voltage Arrester . . .

shut off, the plate resets itself. Eliminated are fast burning and frequent replacement of carbons.
The following diagram shows how Type 56 stood up during a strenuous operating test. Note that a charge of 22,000 volts at 240 amperes was reduced to only 650 volts, which could



. . . equals sure power-cross protection

be handled easily by substation protectors.
Order Type 56 Arresters today. Ask for Catalog TM-4068-BPR31

Cat. No.	Dimensions	Shipping Wt.
SB-97	7¾" high x 3⅝" high x 2¼" wide	2¼ lbs.

A product of the Telephone Specialty Department of

AUTOMATIC ELECTRIC

Distributors in U. S. and Possessions: Automatic Electric Sales Corporation
Export Distributors: International Automatic Electric Corporation
1033 West Van Buren Street, Chicago 7, U. S. A.

stantial reduction of the voltage being observed due to the current through the instrument itself. It is also very necessary, as can be readily seen, that all comparative Decibel readings be made on the basis of the *same impedance loop.*

QUESTION:—*Is there any relation between the Decibel Calibration as found in the multitester and the sense of hearing related to the use of the telephone system for the transmission of speech.*

ANSWER: — This inquiry reaches into the theory of transmission efficiency measurement to an extent that is far beyond the scope of the multitester type of instrument. However it can be said that there is a scientific basis for the rating of transmission equipment effectiveness involved. Without attempting to be theoretically complete it can be said

---

"The United States is the great bulwark that stands between freedom and slavery. If the communists could get control of this nation it would not be very long before the whole world be reduced to a state of slavery." — (Dillon, S. C., Herald).

---

that one Decibel when measured electrically is approximately equal to the smallest difference in *sound power* that can be detected by a careful and scientifically trained observer in medium powered sound.

QUESTION:—*We have a friend who has been reading the series of articles on the Decibel Calibration. He has informed us that such graphs as have been published should be drawn on Logarithmic cross section paper rather than on the paper divided into straight decimal ruling. As a matter of pure curiosity will you please explain why the simpler type of ruled paper was used.*

ANSWER:—This is a very proper question. The reason that decimal ruled paper has been used is to make it possible to readily read intermediate values by simple examination of the curves. With Logarithmic ruled paper, on the other hand, it is somewhat difficult to estimate the numerical values of points on the curve which are not directly on one of the ruled lines. Try it yourself and you will see what is meant.

QUESTION:—*In the descriptive text*

of an item of telephone equipment the statement was made that the output of a certain pair of terminals was 90 Decibels down. Will you explain just what this statement means. We are not able to work it out ourselves although the material on the Decibel Calibration that has been published has given us a more satisfactory understanding of this entire subject.

ANSWER:—This inquiry, while it is not out of line with the general subject in the least, is entirely *outside the scope* of any reading of any small multitester with which we are acquainted. It is, of course, a very practical statement from the standpoint of transmission conventionalities. On that basis the following explanation of the significance of this statement is given.

90 DECIBLES *DOWN* is minus 90 Db. which requires that the logarithm of the POWER RATIO is minus 9. Now minus 9 is the logarithm of 0.000000001 which it will be remembered is the indicated POWER RATIO. Assuming that the ZERO REFERENCE LEVEL is 0.001 watts, as is most likely because of the character of the inquiry, the output in watts described is 0.001 watts multiplied by 0.000000001 or 0.000000000001 watts. In other words a reading of minus 90 Decibels, associated with a ZERO REFERENCE LEVEL of 0.001 watts is interpreted as representing an output of the very small power of 0.000000000001 watts which is far outside of the range of any other practicable method of metering.

This inquiry is well worth while because it points up the possibility of evaluating transmission conditions which are beyond the practical everyday ordinary range of other types of meter.—THE END.

V. D. Casselbury Joins Cullom & Ghertner Co.

CULLOM & GHERTNER Co., printers, lithographers, and publishers, of Nashville, Tenn. and Atlanta, Ga., has announced the appointment of Vern D. Casselbury to its staff as advertising and sales promotion manager.

Mr. Casselbury, former district manager of Industrial Products Co., Inc., Mt. Pleasant, Tenn., is a graduate of Mansfield State Teachers College, Mansfield, Pa.

YOU BUY DEPENDABILITY

WHEN YOU BUY A

RAYTHEON RECTICHARGER

(BATTERY CHARGER)

Dependability is the number one requirement of equipment for the Telephone Industry.

RAYTHEON ENGINEERING REPORT

SUBJECT: Oldest RectiChargeR

Careful testing and inspection of this unit reveals:

1. Electrical qualities in no way impaired (see chart).
2. A noticeable lack of rust or corrosion on chassis, hardware and components.
3. Original paint shows no sign of deterioration.
4. No evidence of embrittlement or cracking in varnish on magnetic components.
5. All hardware sound and secure.
6. Cable firm and unbroken.
7. Lacing intact with all wiring firmly in original position.
8. All soldered joints secure and strong.

(Signed) George L. Blais
ENGINEERING DEPT.

The dependability of Raytheon RectiChargeRs is amply demonstrated by the service records of units now in use. A typical example is shown in the Engineering Report at the right. And there's no reason why the "old" RectiChargeR described in the report can't go on giving the same faithful service for many more years.

It's no accident that Raytheon RectiChargeRs are setting performance records. Every detail of electrical and mechanical design has been carefully worked out with dependability as the guiding principle.

You get dependability automatically when you buy a Raytheon RectiChargeR, just as you get fully automatic battery charging — with constant voltage output over the complete load range regardless of input change — without under or overcharging.

RAYTHEON
MANUFACTURING COMPANY
EQUIPMENT SALES DIVISION
DEPT. 6270-TE, WALTHAM 54, MASSACHUSETTS

DISTRICT OFFICES: BOSTON, NEW YORK, CLEVELAND, CHICAGO, NEW ORLEANS, LOS ANGELES (WILMINGTON), SAN FRANCISCO, SEATTLE
INTERNATIONAL DIVISION: 19 RECTOR ST., NEW YORK CITY

RAYTHEON PRODUCTS INCLUDE: RectiChargeR* battery chargers; RectiFilteR* battery eliminators; Voltage stabilizers (regulators); Transformers; Tubes and other electronic equipment.

*Reg. U. S. Pat. Off.

Specify Raytheon RectiChargeRs and RectiFilteRs for completely dependable Telephone service. Your supplier offers a complete line for all requirements. Ask him for details or write direct.

Lincoln Tel. & Tel. Completes Installation of Intertoll Dial Switching Equipment

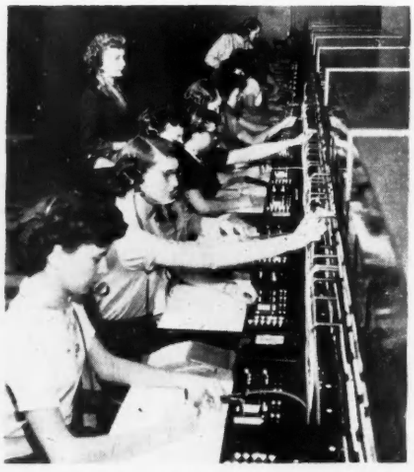
CONNECTION with the national operator intertoll dialing system was made by the Lincoln (Nebr.) Telephone & Telegraph Co. on December 13. Intertoll dial switching equipment and a new 56-position toll switchboard were placed in service on that date at Lincoln in the company's new three-story equipment building.

The Lincoln intertoll equipment is now the dial toll center for operator long distance dialing in the southeast 22 counties of Nebraska. Through this equipment LT&T operators, together with some connecting company operators, have direct dialing connection with about 17 million telephones in the United States and Canada and 87,000 of the 115,000 telephones served by LT&T in Nebraska.

The 87,000 dial telephones of the company in 83 of its exchanges also have direct inward connection with the operator toll dialing system.

This was the last of a series of five cutovers of new equipment at Lincoln that marks the completion of a current $3,200,000 expansion and improvement program of facilities for local and long distance service.

In April, 1953, local dial switching equipment for Lincoln's "5" exchange was cut from the 14th and M Streets building to the new building at 15th and M. In December a new "7" exchange was placed in service with lines being cut to it from the "2," "3" and "5" exchanges.



A small section of Lincoln's new long distance switchboard. From this board, operators can reach 17 million of the 50 million telephones in the United States and Canada directly by "keying" 11 numbers. No assistance from distant operators is required except for "Information" service. The board has positions for 56 operators, 12 more than the old board at 14th and M Streets. Service assistants standing are EVELYN KOCH and WILMA WERGIN.

Present capacity of the "5" and "7" exchanges is 6,800 lines of Automatic Electric, step-by-step, high type equipment, an increase of 3,000 lines. A line IDF provides flexibility in the cross connection of lines for number assignment and adds to cable capacity.

In December a new PABX for the company and a new 12-position information switchboard were placed in service. The information board automatically distributes calls to the various positions and also provides for a separation of calls by key control for local information, toll and intertoll information and intercepting (changed numbers).

The new 56-position toll switchboard replaces 42 positions in the old

Eliminates unsightly festoons of drop wire and innumerable drop wire clamps—plus the time it takes to install them. Think what this saves on apartment and commercial buildings! Thermoplastic insulation stands hardest wear, toughest weather—yet strips easily. Strong No. 19 AWG copper conductors make cable self-supporting over normal drop wire spans. Telephone men who use this neat-looking cable like it. So will you. Order today!

Buy Automatic's APPROVED Supplies
Highest Quality
Biggest Line
Fastest Service

Made by General Cable for

AUTOMATIC ELECTRIC

Distributors in U. S. and Possessions: AUTOMATIC ELECTRIC SALES CORPORATION
Export Distributors: International Automatic Electric Corporation
1033 West Van Buren Street, Chicago 7, U. S. A.

building. It is equipped with key senders and provides 30 CLR positions and 26 TX positions. It has connection with 312 toll circuits which connect into the national toll dialing network. Provision is made for an ultimate capacity of 112 toll positions.

In designing the intertoll equipment, LT&T engineers specified a simplex pulsing train in lieu of the more common loop pulsing train in order to gain pad control. Two DB switch pads were used in accordance with transmission standards established for nationwide toll dialing.

A major part of both local and toll equipment was installed by the Automatic Electric Company with LT&T men handling the moving of usable equipment from the 14th and M building to 15th and M. Western Electric installed a TWX concentrator for trunking between Omaha and Lincoln, a voice frequency telegraph system to provide 18 telegraph trunks between these cities and 76 of the 205 channels of carrier equipment used for toll and special service facilities.

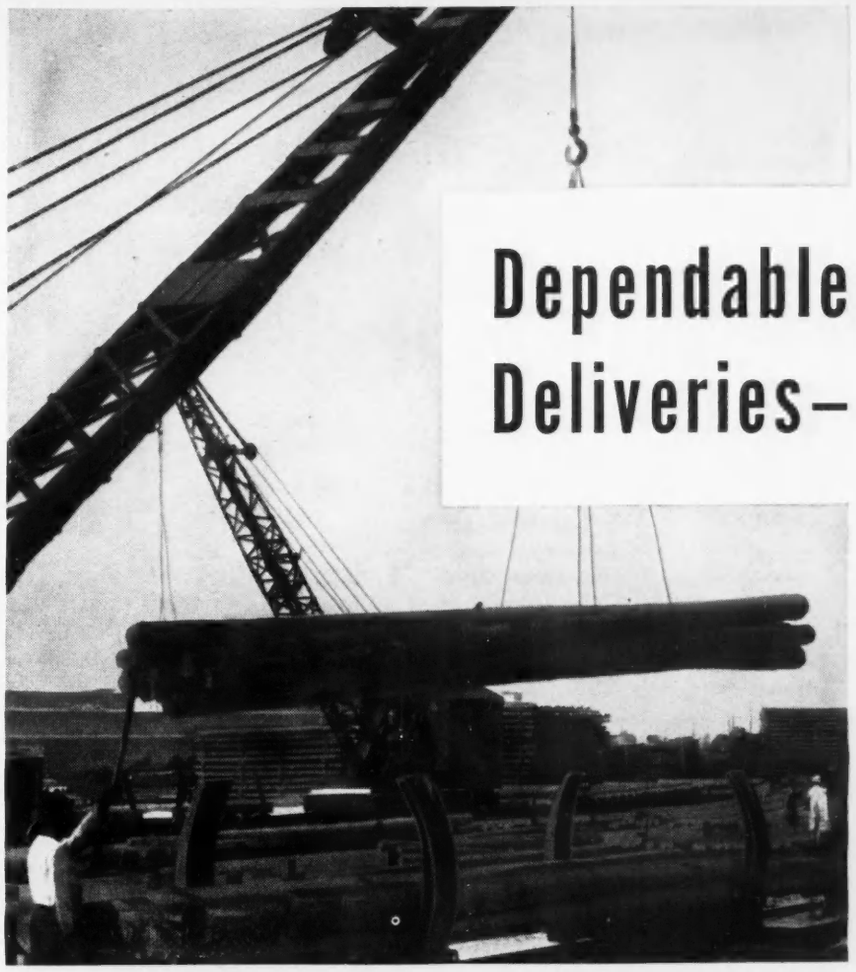
LT&T will continue to occupy its present building at 14th and M Streets for general offices and the Lincoln business office. Local dial switching equipment for the "2" office will also remain at 14th and M.

Ultimately the company plans to extend the new three-story building at 15th and M to eight stories and add a three-story wing eastward toward 15th Street. When this is done the 14th and M building will be vacated.

REA Combats Problem of High Construction Costs

EARLY ATTENTION has been given to the "very serious problem" of high costs of telephone system construction. Rural Electrification Administrator Ancher Nelsen pointed out Jan. 11 in his address before the National Rural Electric Cooperatives Association convention in Miami. Mr. Nelsen said "we had a study made by some of the same people who battled this problem in the early REA years," and "they have already come up with some very practical and helpful suggestions."

"We have also given some attention to the problem of getting industry-wide cooperation in the telephone field, recognizing the close interrelationship that must exist between



One of our valued customers writes: "We have been buying poles and treated timber from you since about 1930. Your products have been very satisfactory. Also, your service in getting shipments to us has been very prompt."

Koppers Poles go out on schedule!

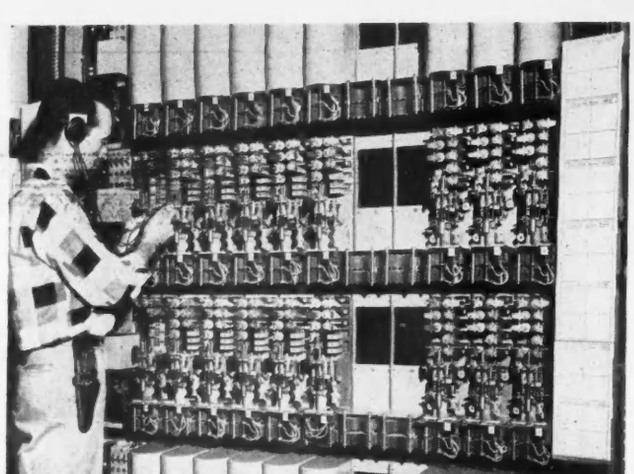
• Koppers has a "head start" when it comes to pole deliveries. Because Koppers has many wood-treating plants, located in strategic places. And these plants carry ample stocks.

Koppers Poles are *good* poles, too. Pressure-creosoted for their full length, these poles are fully protected against decay, weathering and termite attack. You get long service life from dependable Koppers Poles.

And you can count on *Koppers,* the best known name in pressure-treated wood for quality, service, and experience.

KOPPERS COMPANY, INC.
Wood Preserving Division • Pittsburgh 19, Pennsylvania

KOPPERS ® PRESSURE-CREOSOTED WOOD



Switchman AL DOUGHERTY testing a small group of connector switches which serve Lincoln subscribers with "7" prefix numbers. About half of the second floor of the new telephone building is occupied with step-by-step, Automatic Electric dial switching equipment for the "5" and "7" exchanges.

various telephone organizations if rural subscribers are to get good service over a wide calling area," he declared. We have pledged to the industry reasonable consideration of its problems, and we feel we are gaining its support in realizing our objective of bringing telephones to the farms of America.

"I think it can be said that these efforts are bearing fruit. We have already made some $32,886,000 in telephone loans during the present fiscal year, and we do not have much doubt of the possibility of lending the full $74,000,000 that is available for this program during the year. That will be two-thirds of the amount loaned in the entire previous history of the telephone program.

"Good progress is also being made in getting REA-financed telephones to ringing on farms, which is the real test of success. There are now some 64 systems in service, providing modern service to about 38,000 subscribers as a result of REA financing."

The success of the REA program under Mr. Nelsen was emphasized in a talk to the convention by Rep. Harold O. Lovre (R., S. Dak.), Rep. Capitol Hill, adding that support for the REA program cuts across party lines in Congress.

He added, "In the telephone program . . . I am impressed by what has been done to encourage industry-wide cooperation." Pointing out that telephone systems must have connections with other telephone operations, he said the cooperation is particularly evidenced in the recent series of telephone loans in North Dakota. This was one of the most "intricate" situations in REA history, involving interrelationships among cooperatives, mutuals, and Bell and Independent companies, he declared, and "the fact that the whole transaction was worked out with a minimum of confusion and difficulty is a tribute to what an attitude of cooperation can accomplish."

Court Forbids Refunds If ICC Ruling Is Upset

THE ILLINOIS SUPREME court ruled last month that once the Illinois Commerce Commission declares a utility rate valid, customers are not entitled to refunds in the event a court later sets aside the rate increase.

The case involved Mandel Brothers Department Store and the Chicago Tunnel Co., which operates the underground railway serving the Loop area. Mandels had sought reparations for money it paid the tunnel company under a rate increase granted by the ICC but later set aside by the Circuit court.

Harry R. Begley, special assistant attorney general for the ICC, said the ruling settled a question which had never been tested before the high court.

Churchill Names Ericsson Export Distributor

S. T. GULLICKSEN, president of the Churchill Cabinet Co., Chicago, has announced the appointment of the Ericsson Telephone Sales Corp., 100 Park Avenue, New York City, as export distributors of both the indoor and outdoor telephone booth line manufactured by the Churchill company.

Ericsson Tel. Sales Corp. is one of the oldest telephone manufacturing and operating companies of Europe.

Construction
With the Double
and America's
Exide-Manchex
telephone batteries

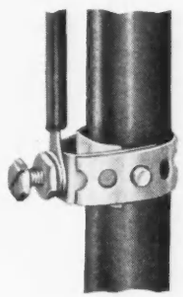
assure positive operation
For Central Office and Private Branch Exchange Equipment
This is proven daily in exchanges of every si
. . . for over 60 years Exide Batteries have bee
serving the Telephone Industry . . . the Ma
chester positive plate with its exclusive butto
type construction provides exceptionally lon
life . . . latest developments on molded gla
jars permit compact space saving installatio
. . . heavy terminal posts with copper inser
provide extra conductivity for sustained vo
age at high discharge rates . . . microporo
rubber along with slotted plastic separato
are impervious to chemical and electrical r
actions . . . plastic spacers assure plate alig
ment . . . for assured dependability, long li
and low-cost maintenance use Exide Manche
The Electric Storage Battery C
Philadelphia, Pa.
1888 . . . Dependable Batteries for 66 Years . . . 19
STROMBERG Telephone CARLSON
TELEPHONES, SWITCHBOARDS • SOUN

Materials and Supplies . . .

Guarantee of Stromberg-Carlson Leading Manufacturers . . .

reliable station ground clamps

• • • for all telephone, radio and signal circuit station grounds. Design principles of this clamp are field-proved to maintain high pressure contact and maximum conductivity to joint.

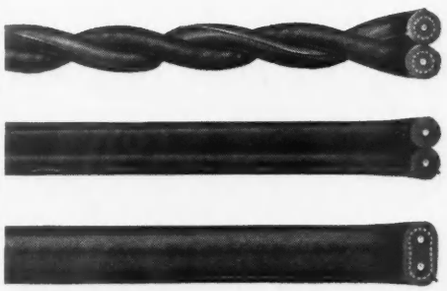


Station Ground Clamps are adjustable for grounding to water pipe

"RELIABLE" IDENTIFIES THE QUALITY

PHELPS DODGE TELEPHONE DROP WIRE

ALL TYPES—FOR HEAVY-DUTY SERVICE



✓ **Copperweld conductors** for strength

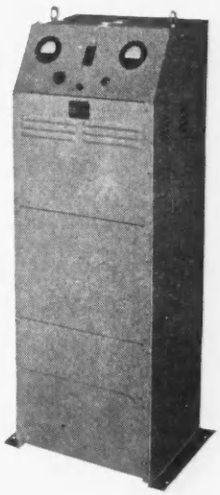
✓ **Habirshaw insulation** for reliability

✓ **Neoprene sheath** for high resistance to abrasion and weathering

PHELPS DODGE COPPER PRODUCTS CORPORATION

for longer battery life and service . . .

the new RAYTHEON "high-rate" RectiChargeR!*



This constant potential battery charger like all Raytheon RectiChargeRs, is completely automatic. It has special dry disc rectifiers plus an exclusive Raytheon Magnetic Amplifier Control Circuit which maintains precise DC voltage output at any load in the presence of wide changes in AC input voltage . . . increases battery life by eliminating over and under charging.

It handles inexpensively all normal power requirements and allows the battery to "stand by" fully charged to meet all emergency demands. You get noiseless current at constant voltage by simple connections to a power outlet and your battery. It is ideally suited for use with systems requiring power for 22/24 cells of battery.

*Reg. U. S. Pat. Off.

Distributed by STROMBERG-CARLSON

ROCHESTER • CHICAGO • ATLANTA • KANSAS CITY • SAN FRANCISCO • TORONTO

• SOUND EQUIPMENT AND ELECTRONIC CARILLONS • INDUSTRIAL, INTERCOMMUNICATION SYSTEMS • TELEVISION, RADIOS AND RADIO-PHONOGRAPH

Know Your Commissioners

Meet Hon. C. L. Doherty

HIS SURNAME is Doherty — from which it can no doubt be safely assumed that in some past generation an ancestor was part of the history of the Emerald Isle. Probably — as this study of our subject indicates — one who had kissed the Blarney Stone.

His intimates know him as "Roy." To the public at large he is the Hon. C. L. Doherty, member of the Public Utilities Commission of the State of South Dakota, and the current president of that potent organization, the National Association of Railroad and Utilities Commissioners.

There may be some question as to just how large that public is; in fact, one observer says: "From the many contacts made by him through the numerous interests with which Roy is constantly in touch, we believe he has a speaking acquaintance with more people by their first name than any other person in South Dakota."

To that we will add, of our own knowledge, that Roy Doherty knows and is favorably known by a lot of people in a lot of other places, too.

We do not think the telephone industry need fear C. L. Doherty as a regulator — unless, that is, the industry tries to get something to which it is not entitled. We do not think it would get that from Commissioner C. L. Doherty. But we do think that he will do his best to see that utilities get an equal deal.

Not long ago, in fact, he dissented in a 24-page brief from a majority decision of his own commission, refusing certain rate increases to the largest telephone company in his state. The matter went to the State Supreme Court and wound-up with the dissent being sustained.

When he became president of NARUC last September, Mr. Doherty said in his inaugural address: "The way we do our job will determine whether utilities can continue vigorous and capable of giving good service where and when the nation needs it . . . Because when we serve John Q. (Public's) long-range interest and assure continuity of good service and a vigorous, financially-sound utility, we are meeting our social responsibility."

Well, maybe some forbear of Roy Doherty may have kissed the Blarney Stone, because they do say that he makes a nice speech. But what we have quoted is not blarney, but the innermost feelings of the man himself.

A veteran of 17 years in utility regulation, Roy Doherty is a product of western pioneer parents and has spent his life in South Dakota. He is continuously active in matters of civic improvement, and is particularly interested in the problems and training of youth, and has sponsored many athletic ventures for young people. He has also had a very successful business career.

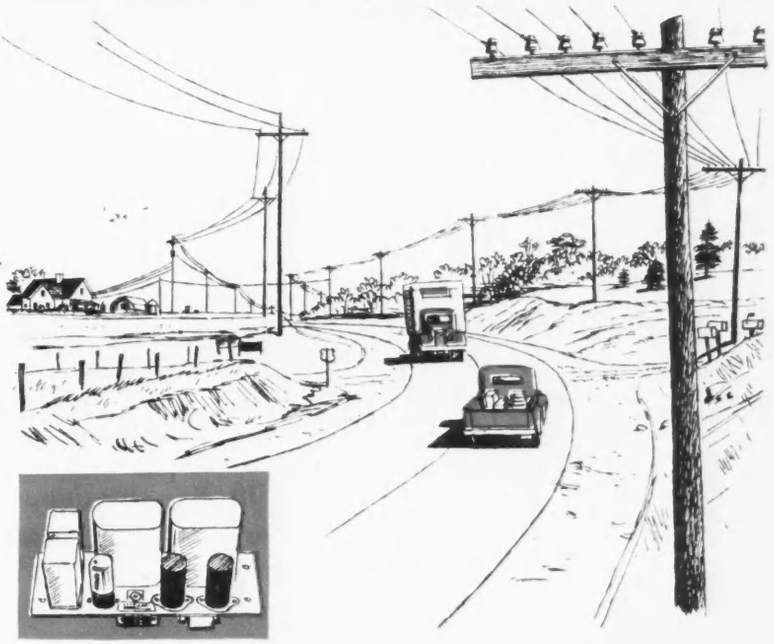
Mr. Doherty's immediate family consists of his wife, two sons and four daughters. His oldest son is in the armed services, recently home from a four year stretch in the Orient. His four daughters are all married to men who have served or who are now serving in the military service.

Like the people of his home state of South Dakota, we, too, call Roy Doherty a good citizen — not only of South Dakota but also of the United States of America.

GraybaR TELEPHONE NEWS

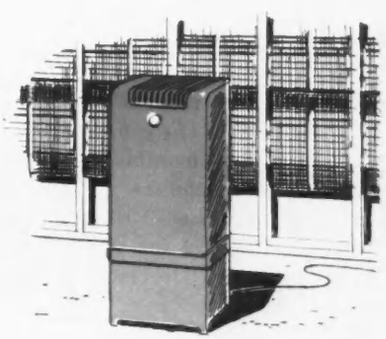
SILENCING A NOISY NEIGHBOR

The increasing noise induced into open wire side and phantom circuits by parallel power lines can be effectively muffled by the Graybar-distributed Speco SNS Noise Suppressor. In many instances, you don't have to resort to costly loading and retransportation methods. One SNS Suppressor at each end of the circuit changes the relationship between noise and voice so that noise is no longer objectionable. Result: more circuits working for you . . . more satisfied customers . . . and more toll revenue.



SMOOTHS OUT A JANGLE

The USI Multi-Frequency Ringer changes a party line telephone's ring from a jarring jangle to a smooth, pleasing jingle. Vertical mounting of the gong assembly, a unique clapper, and a separate resonant weight are the secrets. Designed to the same high standards, this USI ringer was developed as a companion piece to the new Western Electric No. 591 telephone set into which it fits without modification. High impedance of ringer permits bridging up to 10 phones on a party line circuit.



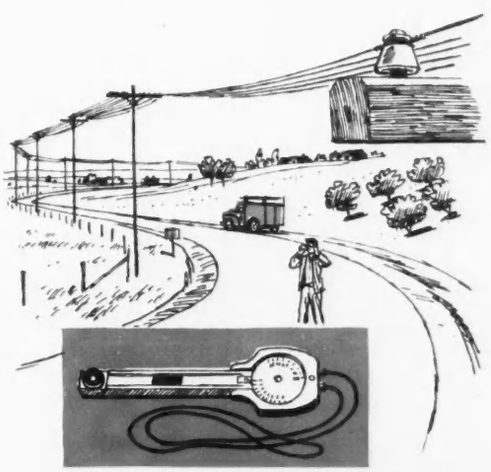
ON GUARD AGAINST HUMIDITY AT REMOTE DIAL OFFICES

Use these compact electric dehumidifiers for protection of costly and vital rust-susceptible equipment in unattended rural dial offices. They efficiently "squeeze" moisture from the air, keeping humidity below the danger level. For prices and specifications on this and any other telephone need, call your local Graybar Representative—he will be glad to assist you.

405-222

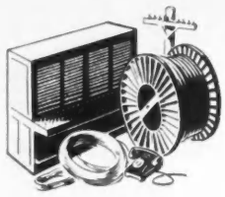
HOW HIGH IS IT?

A lineman can determine the height of a power or telephone line in a few seconds with the Meyer FRF-2 Field Rangefinder. Available via Graybar, the FRF-2 has a special inverting prism so that the operator needn't tilt his head back to make vertical measurements. It's accurate to within 2 per cent over ranges from 8 to 100 feet.



Call Graybar first for... Everything in Telephone Supplies

GRAYBAR ELECTRIC CO., INC.
Executive Offices:
Graybar Building, New York 17, N. Y.
IN OVER 110 PRINCIPAL CITIES



Court and Commission Activities

Utah Commission OK's Parma rate increase . . . New rates approved for Ashland, Ill. . . . Construction rates approved for Nebraska company . . . Bell rate increases approved in five states.

Utah Commission OK's Parma Rate Increase

THE UTAH Public Utilities Commission last month awarded the *Parma (Utah) Telephone Co.* a 10 to 18 per cent monthly rate increase for its 950 customers.

The commission scaled down a company request for increases ranging up to 25 per cent. The company was authorized a $3892 increase in annual revenue in place of the $7461 increase it asked.

The commission refused to allow several items listed in the company application as operating expenses, including salary bonuses to two employes.

But it ruled that the operating conditions of the firm have been "radically changed." The company converted to dial on April 1, 1953.

New Rates Approved For Ashland, Ill.

THE ASHLAND (Ill.) Telephone Co. last month received authority to boost its rates $2372 a year in Ashland. The *Illinois Commerce Commission* said the new rates will give the company $926 annual return on investment.

Rate Hike Approved for North Dakota Company

AUTHORITY TO raise telephone rates in the Hillsboro, Galesburg and Cummings, N.D., areas was granted last month to the *Traill County Telephone Co.*, Hillsboro, by the *North Dakota Public Service Commission.*

The increase was granted on the basis of information presented at a public hearing held in Hillsboro Dec. 3 before *Commissioner E. H. Brant.*

The new schedule provides a $7.50 net monthly rate for one-party business telephone and $4.50 for one-party residence telephone. Present net billing in Hillsboro is $4.10 for a one-party business telephone and $3.34 for one-party residence.

In its statement on finding of fact issued in connection with the case, the commission pointed out that testimony presented by the company at the hearing indicates that "upon completion of the proposed dial conversion program the company's operating revenues, under the proposed rates, will be an estimated $52,643 annually, and annual operating expenses will amount to $36,986, leaving a net operating income of $15,657, which will yield the company a rate of return of approximately six per cent of its net investment in telephone property."

As pointed out in the commission's order, the estimated cost of new telephone plant and equipment to be installed is $188,926.

Completion of the dial conversion and plant modernization program is expected within "about 24 months" according to the commission's findings.

The findings further state that the project involves construction of "new central office buildings at Galesburg and Cummings; an addition to the central office building at Hillsboro (work on which was started last fall); installation of new switchboard equipment in each exchange; metallicizing of all rural telephone lines and reduction of the number of rural subscribers per line; and installation of new subscriber station facilities."

As of Sept. 30, 1953, the company served 785 stations operating magneto telephone exchanges at Galesburg and Hillsboro, with approximately 49 per cent of company-owned stations in rural territory served by the company.

Construction Rates OK'd for Chapman, Neb., Company

THE NEBRASKA State Railway Commission has granted the *Chapman (Neb.) Telephone Association* authority to establish certain rules and regulations governing construction of telephone lines in its territory.

According to the application filed by *G. A. Rembolt*, president of the Chapman Association, the company agrees to build the first one-half mile of telephone line anywhere to a customer that belongs in the Chapman Telephone Association territory. The customer will be required to furnish and set the poles specified by applicant and install them whatever distance is required in excess of the first one-half mile. Applicant will then

complete and become the owner of the line. The customer will be charged for any costs incurred by applicant in obtaining necessary right-of-way. This shall include the cost of the permit when going under railroad right-of-way.

Bell Rate Increases Approved In Five States

RATE INCREASES for Bell System companies in Utah, Nevada, North Dakota and New Hampshire were approved by state commissions in the past month.

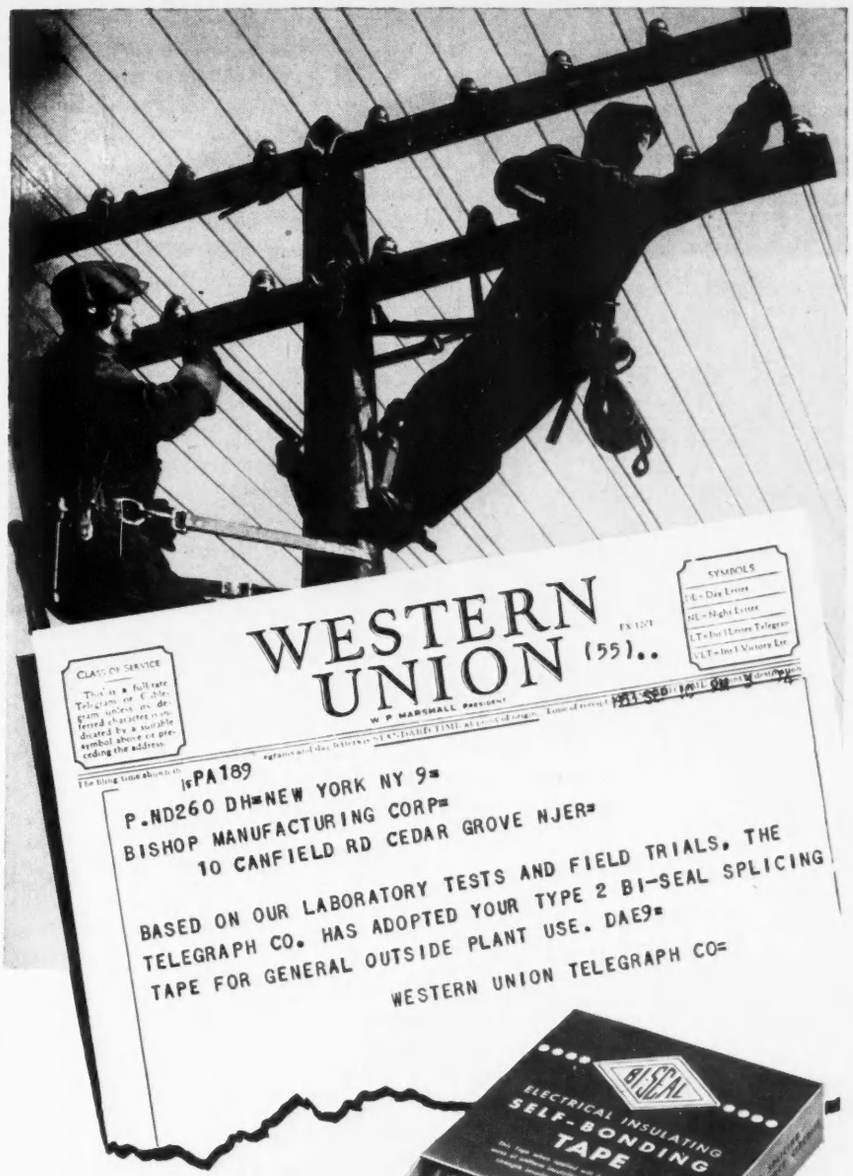
The *Utah Public Service Commission* authorized the *Mountain States Telephone & Telegraph Co.* rate increases of $1,678,000 based on the estimated number of telephones at the end of the year. The order followed hearings in Aug. and Nov., 1954 on a complaint filed by the company in May, after the commission denied an application filed by Mountain States in August, 1952.

Utah Commercial Manager, F. D. Sawyer said, "While the increase granted by the commission is less than we believe is needed to meet our full revenue requirements, it will materially improve our present poor earnings in Utah. At the cost of about $8,000,000 we are just completing the largest telephone expansion program ever undertaken in any one year in the history of our Utah operations."

The *Nevada Public Service Commission* granted the *Bell Telephone Co. of Nevada* rate increases averaging two cents a day per telephone, and totaling about $261,000 a year, effective Jan. 1. The commission authorized overall additional revenues in the amount asked by the company in September, but made revisions in the increases for different classes of service.

In its order, the Nevada commission found that during the first nine months of the year, Bell of Nevada's rate of return was only 5.11%, and concluded that a little more than 6.3% was reasonable on the rate base at the end of the test period. Under the new schedules, business and residence two-party service will go up 50 cents monthly, and one-party service is increased 75 cents a month. Four-party service rates were boosted 25 cents a month, while a 10-cent coin box rate was approved.

The *North Dakota Public Service*


WESTERN UNION (55)..
W. P. MARSHALL, President
SYMBOLS
DL = Day Letter
NL = Night Letter
LT = Int'l Letter Telegram
VLT = Int'l Victory Ltr
CLASS OF SERVICE
This is a full rate Telegram or Cable-gram unless its de-ferred character is indicated by a suitable symbol above or pre-ceding the address.
1sPA189
P.ND260 DH=NEW YORK NY 9=
BISHOP MANUFACTURING CORP=
10 CANFIELD RD CEDAR GROVE NJER=
BASED ON OUR LABORATORY TESTS AND FIELD TRIALS, THE TELEGRAPH CO. HAS ADOPTED YOUR TYPE 2 BI-SEAL SPLICING TAPE FOR GENERAL OUTSIDE PLANT USE. DAE9=
WESTERN UNION TELEGRAPH CO=
BI-SEAL
ELECTRICAL INSULATING
SELF-BONDING
TAPE

After extensive laboratory and field tests, Western Union's own engineers found that Type 2 Bi-Seal polyethylene-based insulating tape provides a permanent, watertight seal with an extremely low degree of moisture vapor transmission. Type 2 Bi-Seal, designed to meet the specific requirements of the communications field for wire and cable splicing, is a self-bonding tape that retains its flexibility even when applied at minus 40°F and offers exceptional resistance to weathering, aging and corrosion. Send today for complete data and specifications.

APPLIES FAST · STAYS FAST
BI-SEAL
BISHOP MANUFACTURING CORPORATION
10 CANFIELD ROAD, CEDAR GROVE, NEW JERSEY

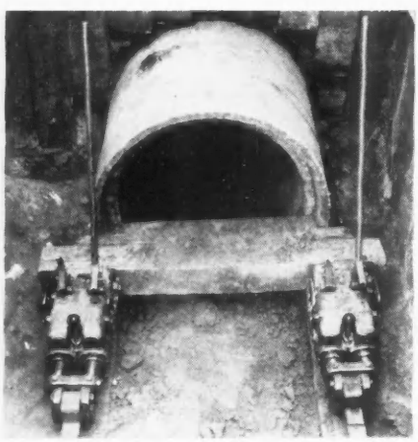
FAST, EASY WAY

TO INSTALL PIPE...

AT LOWER COST

PUSH PIPE UNDERGROUND WITH A GREENLEE HYDRAULIC PUSHER

Here's the simple, cost-cutting way to install underground pipe. Speed your jobs with a GREENLEE Pusher. One-man-operated, portable, simple to operate. No tearing up of pavement . . . eliminates extensive ditching, tunneling, backfilling, tamping, repaving. Cuts job time to a fraction. GREENLEE Hydraulic Pipe Pusher often pays for itself on first job. Two sizes — model shown above for pushing 3/4" to 4" pipe. Larger unit, below, for pipe over 4", concrete sewer pipe and large drainage ducts. Power pump (as shown above) also available for extra ease and speed of operation.



TOOLS FOR CRAFTSMEN

GREENLEE

Write today for descriptive literature, Greenlee Tool Co., 2002 Columbia Avenue, Rockford, Illinois, U.S.A.

Commission authorized improvements of $892,000 in *Northwestern Bell Telephone Co.* revenues, or $411,000 annually after taxes. New local exchange rates were effective with billing dates starting Jan. 4, while intrastate long-distance charges over most distances between 35 and 175 miles were affected. The commission also approved extension of the 10-cent rate for local messages from public and semi-public telephones.

Increases authorized in North Dakota were slightly more than half the amount requested by the company. The commission concluded that previous rates were producing earnings of less than 4-½ per cent, measured on the rate base as of June 30.

The *New Hampshire Public Utilities Commission* approved increases in the rates of the *New England Telephone & Telegraph Co.*, effective Jan. 7, totaling about $800,000 a year.

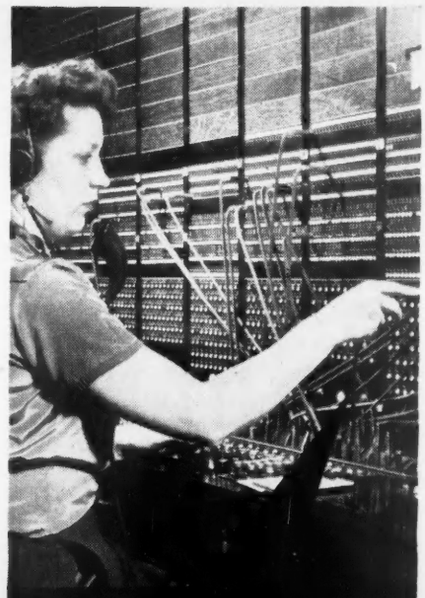
Washington Bureau Reports

(Continued from Page 48)

it did in the early days of the electrification program. "The special problems of the telephone program do require more manpower than apparently was the case in the early days of the electric program," he declared.

The REA Administrator commented in an address to the Minnesota Telephone Association that "REA is primarily interested in the end result—that a substantial proportion of farm families have dependable telephone service at rates they can afford to pay — rather than in making loans. By the same token, the more of the rural telephone jobs you are willing and able to do with commercial financing, the better for farm families."

He added, "The law clearly intends that REA will supplement, not compete with, the efforts of commercial telephone companies in providing more and better service to rural people. I am fully in accord with this cooperative approach. I am convinced that rural subscribers and the entire nation will be best served if all groups in the telephone industry



THE CALL IS FOR COMMERCIAL TELEPHONE CORDS

- Switchboard
- Instrument
- Operator's

IN NYLON NEOPRENE MERCERIZED COTTON

ALSO RETRACTABLE HAND SET CORDS

Made Better to Last Longer!

Switchboard Cords now available with or without plugs

Write for Catalog and Samples

COMMERCIAL

CORD & SUPPLY CO., INC.

26 E. Main St. • Clifton Springs, N. Y.

Phone: CLIFTON SPRINGS 189

CORDS FOR ALL MAKES AND TYPES OF TELEPHONE INSTRUMENTS

work with each other and not at cross purposes."

Mr. Nelsen concluded, "We are against unncessary frills which can pile up construction costs for a new system to a point where it cannot operate soundly at rates farm families can afford to pay. We are warning loan applicants of the importance of cost-conscious planning. We emphasize the need for educating prospective subscribers from the outset that there is no such thing as free service and that they will have to pay for what they get. Even with the most careful attention to costs, the problem of buildnig an economically feasible system in areas where construction costs are high and incomes limited is a serious one.

It is one that cannot safely be ignored. To do so would mean abandoning our efforts to help marginal areas get service on the one hand, or jeopardizing the soundness of the loan program on the other hand. We are pushing ahead with the development and testing of new materials and equipment to lower the costs of providing service in sparsely-settled areas."

Don't Abandon Hope For Excise Reduction

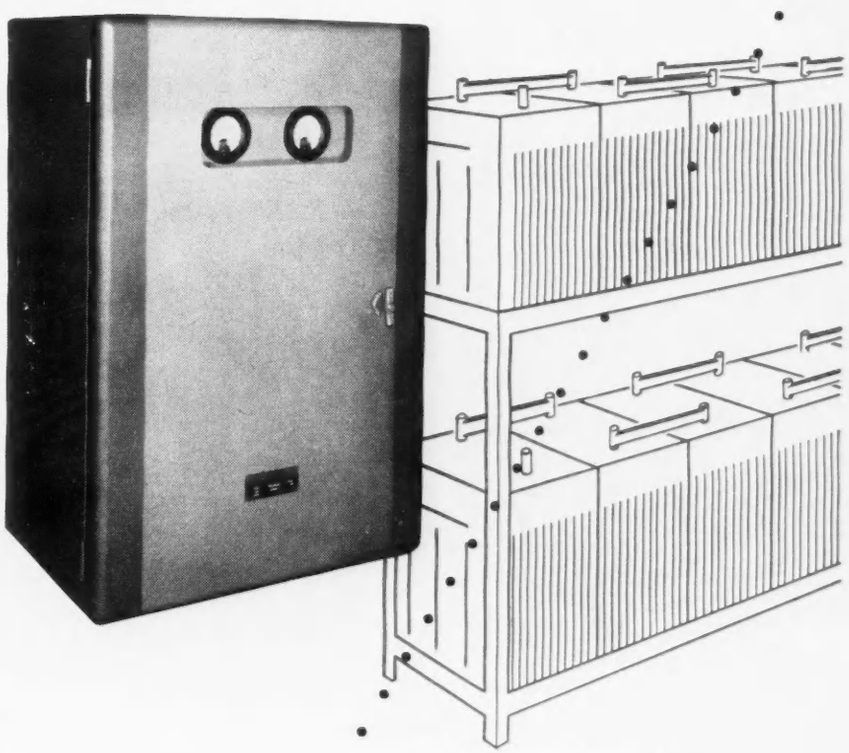
ALTHOUGH supporters of telephone excise reduction or repeal were brought up short by President Eisenhower's tax recommendations, contained in his budget message, it now appears that all is not lost.

The President dealt telephone users something of a blow, it appeared, when he called for the same total yield from excises and did not mention anything about current inequitable excise rates.

It is thought, however, that the administration viewpoint is that it is better to button up its efforts to keep the corporation income rate at 52% and hold gasoline, liquor, and other excises slated for April 1 reduction at their present levels, before talking about other excises. Administration emphasis on excise cuts also would drastically reduce purchases of certain items, in the hope of future excise cutbacks, it is felt.

At a later date, it is now hoped, the administration either will offer some proposals for cuts in some of the heavy rates on essential items, or else not oppose Congressional moves in that direction. —THE END

for LONGER battery LIFE



keep the floating voltage constant with PECO Automatic Battery Chargers

The PECO Battery Chargers accurately float the control battery of any power station or substation which has a reasonably constant switchboard load; furnishes power to the load and maintains a fully charged battery, ready for any emergency.

To provide extreme accuracy of electronic control and the exceptional reliability demanded by this type of service, Power Equipment engineers designed this PEC-626 Automatic Battery Charger by starting with the rugged components of a manual charger, then added a magnetic system for coarse voltage control and a simplified electronic system for fine voltage control.

As an illustration of the accuracy of the PECO charger, this example can be used: the DC output is sufficient to maintain 60 lead acid battery cells at 129 volts; it will also furnish power to switchboard loads within the rating of the charger, and at all times the output voltage is automatically regulated to within ± 0.5 percent, for AC line voltage fluctuations of ± 5 volts on a 230 volt circuit.

Exceptional reliability is shown by the fact that if the electronic control section should be disconnected, the magnetic control section will still automatically hold the output voltage to within ± 3 percent of nominal voltage.

Write for complete specifications today.

POWER EQUIPMENT Company

Battery Chargers ☆ Battery Eliminators ☆ D.C. Power Supply Units ☆ Regulated Exciters ☆ and other Special Communications Equipment

5740 NEVADA, EAST DETROIT 34, MICHIGAN

KELLOGG

Your nearest Kellogg shipping point is never far away — KELLOGG'S six conveniently located warehouses and more than 100 supplier distribution points throughout the country assure you fast, economical delivery of guaranteed line supplies.

Your Nearest Kellogg Shipping Point Is Never Far Away!

KELLOGG DIVISION OF IT&T

KELLOGG SWITCHBOARD AND SUPPLY COMPANY
Sales Offices: **79 W. Monroe St., Chicago 3, Ill.**
A Division of International Telephone and Telegraph Corporation

Send Your Next Order for Supplies To:

BRANCH WAREHOUSES AND OFFICES:

6000 W. 51st Street
Chicago 38, Illinois

410 N. Syndicate Avenue
"Midway Area"
St. Paul, Minnesota

1663 Mission Street
San Francisco 3, California

4501 Truman Road
Kansas City 1, Missouri

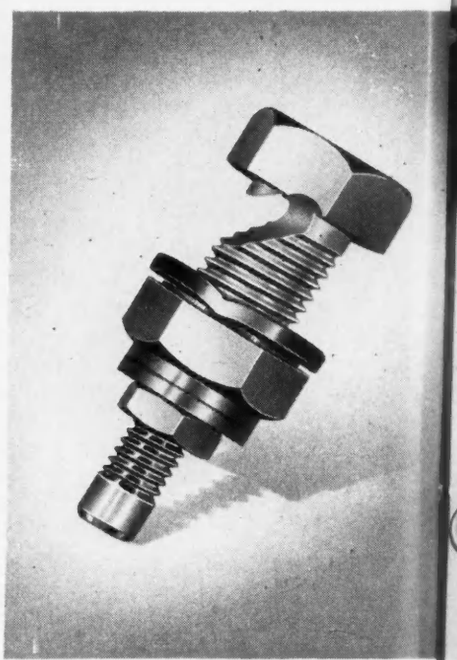
1515 Turtle Creek Blvd.
Dallas 2, Texas

1555 West Fourth Street
Mansfield, Ohio

BRANCH OFFICES:

406 S. Main Street
Los Angeles 13, Calif.

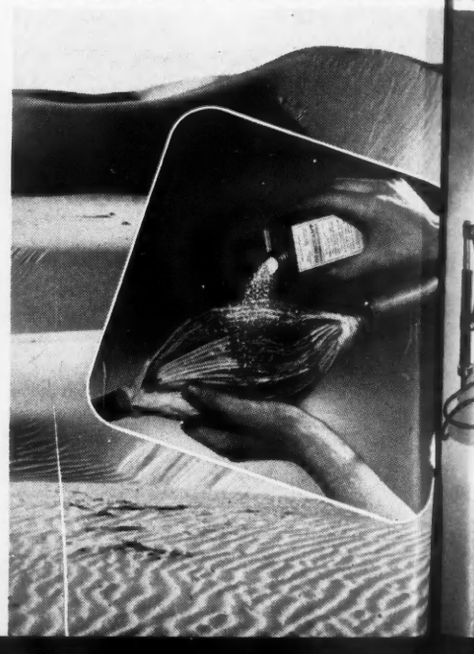
720 S. W. Washington Street
Portland 5, Oregon



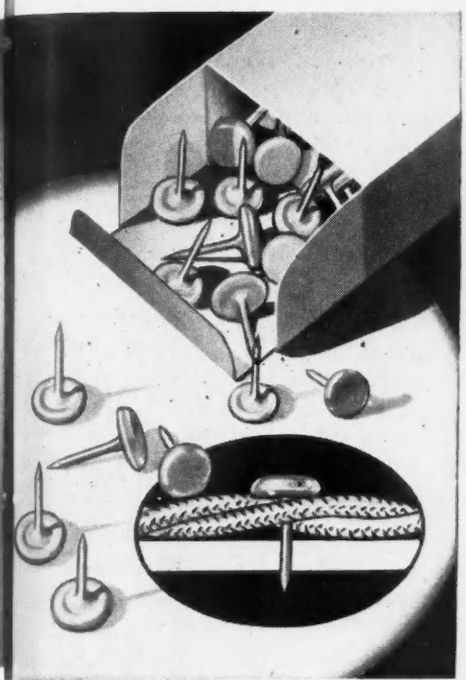
For Use on Iron to Copper Wire. The No. 6A Western Electric Type Bridging Connector has 5/8" Hex Steel Body (slotted for No. 1 B.W.G.) Brass stud with two brass washers held in place with a hex brass nut. Made by CLEVERLY ELECTRICAL WORKS, INC.

•

Drier Than a Desert! The sure way to dry splices in lead covered cables is to sprinkle Drierite Dessicant granules in among the conductors. This W. A. HAMMOND DRIERITE COMPANY product will not harm the sheath, conductors or insulation.



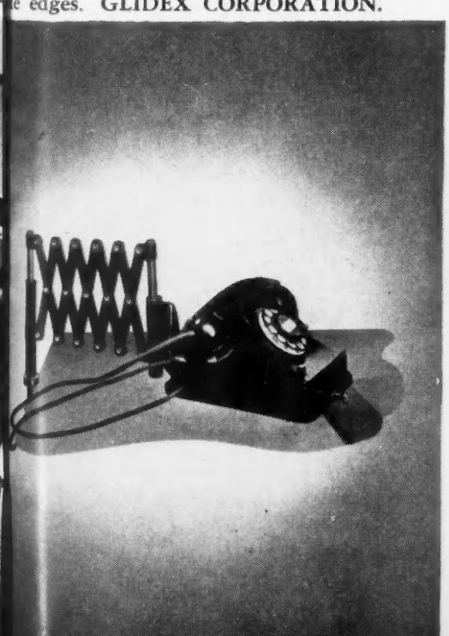
HEADQUARTERS FOR SUPPLIES



Designed for Fastening Wire. Rhodes Inside Wiring Nails are made with special brads for easy driving. Fibre heads insure good insulating qualities—will not damage wire insulation. Nails colored to match insulation. M. M. RHODES & SONS CO.

•

Adds to the Convenience of your Telephone- The Glidex Telephone Bracket saves desk space —keeps phone in easy reach yet out of way. Various types of mountings available for attaching to wall, side of desk, and table edges. GLIDEX CORPORATION.



Long Life Expectancy is built into Southern Pine Poles and Crossarms. Carefully and thoroughly treated by AMERICAN CREOSOTE WORKS, INC., these poles have the extra durability required for dependable service under toughest climatic conditions.

•

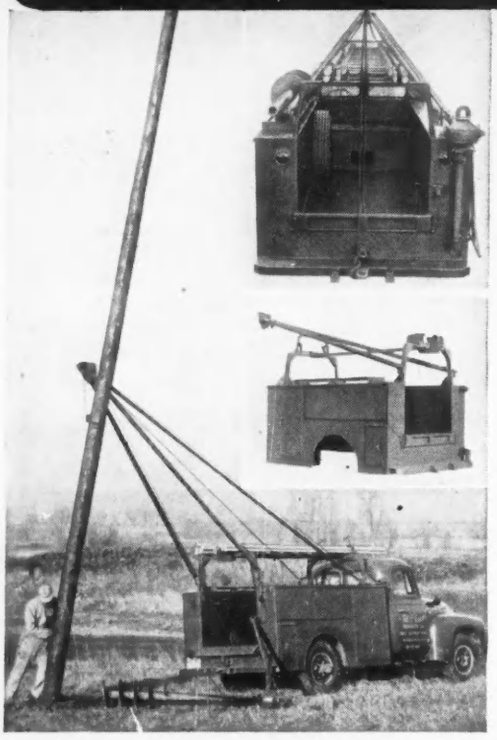
New and Different! —TRIG-R-HEAT Soldering Gun heats instantly on AC or DC—requires no transformer. Gun has built-in light and a 6″ reach—weighs only 12 oz. Equipped with ¼″ Iron Clad Tip, has wattage range of 400-150. P. WALL MFG. CO.

Your Battery Problems Are Solved when you put Gould Plante' and Flote' Batteries to work. Unique features of design cut maintenance and charging costs, lengthen life and reduce replacements. Made by GOULD-NATIONAL BATTERIES, INC.

•

Exchange, Quadded and Composite: Type 775-P for Aerial and Duct Service, Type 775-AP Armored for Direct Burial, Type 775P-SS Self-Supporting using Channell Supports, Type 2094 to REA Spec. PE-14. The ANSONIA WIRE & CABLE COMPANY.

Two-Man COMBINATION TRUCKS Pay Dividends



With a ¾ or 1-ton truck and Tel-E-Lect "Combination" Body, you can . . .

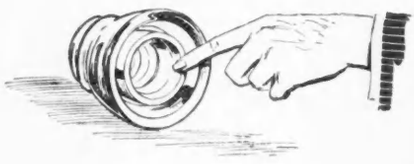
- Dig holes and set poles up to 40'
- Handle your regular service work
- Reach a variety of jobs quicker
- Operate with two men at less cost

IT'S A COMPLETE PACKAGE, tailored for your make and model of truck. Derrick, winch and digger drive are all assembled to the body, ready for your truck chassis. Easily mounted in a few hours by your local mechanic.

Write for Bulletin

TEL-E-LECT
PRODUCTS, Inc.
10013 Minnetonka Blvd., Minneapolis 16, Minn.

PERFECT FIT



With Armstrong's Glass Insulators there's no rocking or wobbling on the pins. Their uniform, accurate thread contour means these insulators fit pins perfectly, stay on tight. For details, call your supplier or write Armstrong Cork Company, Glass and Closure Division, 295 Fifth Avenue, New York 16, New York.

ARMSTRONG'S GLASS INSULATORS
for communications . . . for power

evidence before the commission that some increases must be allowed. The schedule of rates set forth in Appendix 'A' are higher than the present rates but considerably lower in most instances than the rates proposed by the utility.

"The utility will be protected thereby and at the same time the subscribers will be protected as the bond will require that the utility refund to the subscribers the difference, if any, between the rates actually charged and collected under this order and any lower rates which may be approved ultimately by the commission upon the completion of its consideration of the case following 12 months operation under dial. In view of the fact that the utility and the public are both vitally interested in adequate telephone facilities and service in the territory here involved, the burden of preserving the financial stability of the applicant during the period necessary for adjusting its rates and charges should be borne by both such parties."

Schedule of Temporary Rates and Charges of Quincy Telephone Company for its Quincy Exchange

Type of Service	Monthly Rate
Business 1-Party	$ 9.00
Business 2-Party	8.00
Business 4-Party	6.00
Business 10-Party	6.25
Business Extension	1.75
Business Trunks	13.50
Business PBX Ext.	1.75
Business PBX Hotel	1.25
Business Key Extension	2.00
Residence 1-Party	5.00
Residence 2-Party	4.00
Residence 4-Party	3.00
Residence 10-Party	3.50
Residence Extension	1.50
Additional Charges	
Business joint-user	2.00
Key equipment rental	6.00
PBX board (capacity not over 4 trunks and 40 lines)	10.00
PBX board (capacity over 4 trunks and 40 lines but not exceeding 6 trunks and 60 lines)	12.50
Residence joint-user	1.00
Rural business joint-user	2.00
Service Connection Charges	
Main station installation	$1.00
Resume — change of number	2.00
Room move	1.50
House move	2.50
Outside move	4.00

Industry leaders honored R. B. STILL, board chairman of the Illinois Telephone Co., Bloomington at a 50th Anniversary dinner party, Jan. 22 at the Tilden Hotel, Bloomington.

Anniversary Dinner Honors R. B. Still

Honoring R. B. Still, board chairman of the Illinois Telephone Co., who observed his 50th service anniversary last month, a dinner was given at the Tilden Hotel, Bloomington, on January 22.

J. F. Van de Vusse, president of the Illinois Telephone Co., presided at the anniversary dinner and individual speakers — Frank S. Spring, Chicago; W. O. Randall, Jacksonville; Ray Alter, Galesburg; Ben S. Rhodes, Bloomington; and A. S. Crane, Chicago.

Mr. Still started what was destined to become a long and active career in the telephone business at Kemp, Texas, 50 miles south of Dallas, when he became a groundman for the Kemp & Kaufman Telephone Co. This company later became a part of the Southern Telephone and Telegraph Co., which subsequently merged with the Gulf States Telephone Co., Tyler, Texas.

During his period of service with these companies, he worked in various plant capacities, including construction foreman, central office equipment installation, and other supervisory positions. With these companies he served for 27 years in various capacities, including that of general manager.

In July, 1930, he became affiliated with the Gary Group of Independent telephone companies, with headquarters at Kansas City, Mo. In 1932 he transferred from Kansas City to Portsmouth, Ohio, where he supervised the operations of a group of companies located in several Southern states. Later his area of supervision was changed to include Gary Group companies in Pennsylvania and Ohio, including the Portsmouth Home Telephone Co. The Portsmouth company later was merged with several other Ohio companies into what is now the Ohio Consolidated Telephone Co.

On September 1, 1934, Mr. Still became general manager of four Illinois companies; the Automatic Home Telephone Co., Pontiac, Illinois Telephone Co., Jacksonville, Illinois Valley Telephone Co., Streator, and the Wabash Telephone Co., Bloomington. Later he became vice president-general manager of these four companies and when they were merged on December 1, 1945, into the Illinois Telephone Co., with headquarters at Bloomington, Mr. Still was named president. He remained in this capacity until December 1, 1950, when he was elected chairman of the board of directors, which position he now retains.

In addition to his work in the telephone field, Mr. Still has been active in State and National associations of the Independent telephone industry, and has a long record of service in various civic groups and of leadership in community affairs.

He was a member of the board of directors of the United States Independent Telephone Association from 1929 to 1933. He was returned to

The above photo taken at R. B. STILL 50th Anniversary dinner shows (l to r.) MR. STILL; J. G. HARDY, secretary of the Illinois Telephone Association, Springfield; and W. O. RANDALL, district manager of the Illinois Telephone Co., Jacksonville. In 1953, Mr. Randall observed his 50th anniversary in the Independent telephone industry.

the board in 1944 and has continued as a director since that time, serving as first vice president of the national association in 1951 and 1952. From 1916 to 1930 he was president of the Texas Independent Telephone Association, with the exception of a six-month interim when he was relieved by E. C. Blomeyer. He also served the Ohio Independent Telephone Association as a director. He was for two years president of the Illinois Telephone Association, and has been a member of its board of directors since 1935, currently serving as its treasurer and as a member of the board of directors.

Book Review

"Introductory Circuit Theory," by Ernst A. Guillemin; 550 pages; published by John Wiley & Sons, Inc., 440 Fourth Ave., New York 16, N. Y.; price $8.50.

METHODS OF STEADY-state and transient circuit analysis, as well as the basic concepts essential to synthesis procedures are presented in "Introductory Circuit Theory." The new book was written by Ernst A. Guillemin of The Massachusetts Institute of Technology and published in December by John Wiley & Sons.

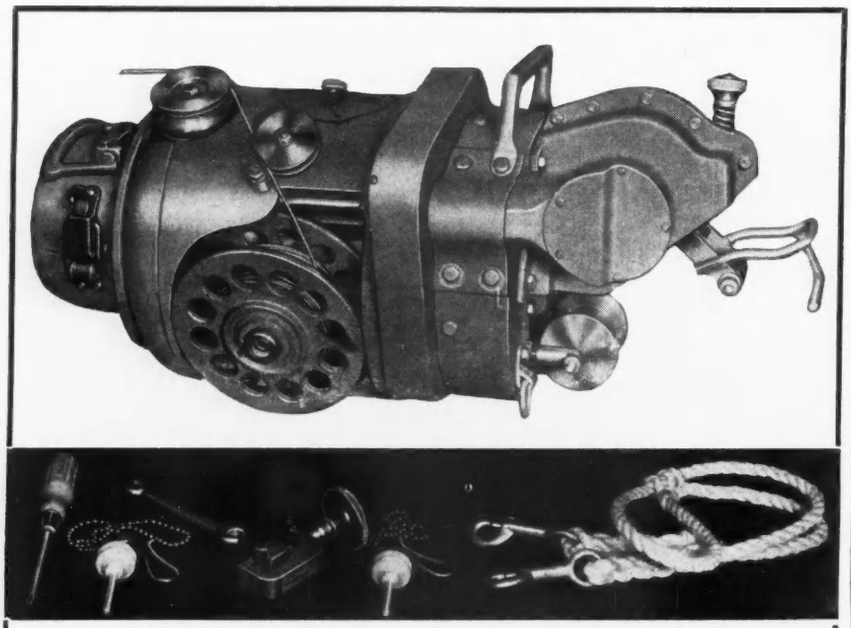
The keynote of Dr. Guillemin's work is perhaps the fact that he does not "talk down" to the reader. Having found through experience that early flexibility and mature absorption go together, he provides all the tools and concepts, and all graphical interpretations and computational aids on which modern advanced research in network theory rest. Here are truly the "tools of the trade," supplied to form a working base.

A variety of unique features remove this volume from the "simplified version" class. Dr. Guillemin deals with the importance of network topology as a means for determining an appropriate set of variables, covers the significance and usefulness of the principle of duality, goes into the concept of complex frequency, and discusses the concept of the impedance function as characterizing both transient and steady-state behavior in terms of the complex natural frequencies of the circuit and the complex frequency of the excitation.

Other significant points are the interpretation and computation of impedances in terms of their graphical pole-zero constellations in the complex frequency plane, and the rigorous attainment of all the computational simplicity, directness, and flexibility of the Laplace transform method with only the most elementary tools of algebra and differential equations.

Professor of electrical communications, Guillemin has had an enthusiastic response to his unique teaching approach. His departure from established procedures also continues to find a wider audience among engineers whose early training has been along more conventional lines. Dr. Guillemin is also the author of "Communication Networks," and "The Mathematics of Circuit Analysis," both published by Wiley.

Copies of "Introductory Circuit Theory," may be obtained direct from John Wiley & Sons, Inc., 440 4th Ave., New York City.



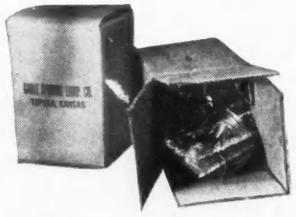
This Package Brings You Up to 67% Savings in Outside Plant Maintenance

When you specify spun cable to protect your outside plant investment, insist upon the Neale Model "D" Spinner. It comes to you complete, with all of the accessory tools to service and maintain the machine. And you can work toward a saving in outside plant protection of as much as 67 per cent . . . the experience of telephone companies in cable spinning, reported from all over the country.

Cable spinning is fast . . . economical . . . and practical . . . for new construction as well as maintenance. You get all the possible advantages of cable spinning when you equip your crews with Neale Cable Spinners. Both the Model "D," shown above, and the Model "B" One Man Cable Spinner are supplied to you complete in every detail . . . no extras to buy.

The Cable Spinning Company maintains an around-the-clock service in spare parts. For complete information on Cable Spinning tools, write or phone your jobber today.

For Best Results Use Neale Wire



Available in 7 different types . . . all made to meet the toughest construction and corrosion problems.

CABLE SPINNING
Equipment Company
3001 TOPEKA AVE. TOPEKA, KANSAS
PHONE 2-7234

Theodore Gary & Co. Issues Income Report

F. S. SPRING, president of Theodore Gary & Co., announced last month that the consolidated income of the company and certain of its subsidiary companies for the years 1949 through 1952 was approximately as follows:

	After Provision For Income Taxes
1949	$5,023,000
1950	4,378,000
1951	3,864,000
1952	3,465,000

The consolidated income includes the income of all subsidiary companies in the Western Hemisphere (principally in the United States and Canada) in which the percentage of ownership is more than 50 per cent, except telephone operating companies. Income of Telephone Bond & Share Co. and Anglo-Canadian Telephone Co. and their subsidiaries, is included only to the extent that such income was distributed as dividends to the company. The above figures reflect the restatement of reserves provided out of income which are no longer required and certain adjustments between income and surplus and are subject to final audit.

It is estimated that the consolidated income for the year 1953, on a comparable basis and after provision for income taxes, will be approximately $3,200,000 or about $10.50 per share on the participating common and the common stock.

As a result of the restatement of reserves and other adjustments referred to above, it is estimated that the consolidated earned surplus of Theodore Gary & Co. and the subsidiaries included in the consolidation was approximately $19,000,000 as of December 31, 1953, or approximately $60 per share on the participating common and the common stock.

Bescher Named District Manager for Koppers

APPOINTMENT OF Ralph H. Bescher as Pittsburgh district manager of sales and operations of the Wood Preserving Division of Koppers Company, Inc., was announced last month by Walter P. Arnold, vice president and general manager of the division.

Prior to assuming this post, Mr. Bescher was manager of the divi-

Please turn to page 104

MIKE THE MOLE SAYS:

Give the GUY a CHANCE

I get around . . . and I know that Chance Anchors really hold

®

YOU GET THE MOST FOR YOUR MONEY WITH CHANCE ANCHORS the most complete line

8-WAY EXPANDING

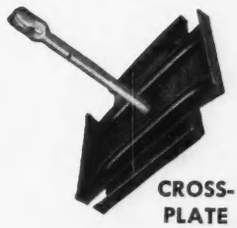
The guy load is distributed all around the anchor—no wasted space between blades. Usually installed in clay or loam.

NO-WRENCH SCREW

For hand or machine installation. Pitch-controlled blade goes down faster and adds to holding power in sandy soil, soft clay or loam.

NEVER-CREEP

Made of structural steel. Pulls *entirely* against solid, undisturbed earth. For extra heavy loads in clay or loam.



CROSS-PLATE

For heavy-duty anchoring in machine-bored holes. Holds better than logs or slugs. Saves time and money.

SWAMP SCREW

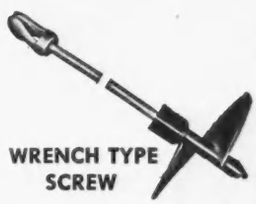
For swamps, marshes, quicksand, river crossings or seasonally flooded areas. Screws down deeply by adding sections of pipe.

8-WAY CONE

Acts as inverted wedge. Flaring base and flat faces increase wedging action. Used in rocky areas with rock wedging.

EXPANDING ROCK

No grouting necessary. The greater the pull, the tighter it wedges against solid rock. Set in 2" drilled hole.



WRENCH TYPE SCREW

All steel—double arc welded. Anchor hub absorbs installation strain. For light loads in sandy soil, soft clay or loam.

POLE KEY ANCHOR

Keys poles at the butt to reinforce them against unbalanced loads in soft soil. Ideal for congested urban areas.

Both the soil type and condition are important factors in determining the type of installation and the kind of anchors to use. That's why Chance Anchors are made in so many types and sizes. The anchors shown above are made in a wide variety of sizes. Each type is designed for certain soil and guying conditions. Each of these anchors will do its specific job better than any other anchor you can choose.

Protect your investment in line construction. Analyze your soil and guying conditions, and specify the Chance Anchors that meet your particular requirements.

There is a CHANCE Anchor Distributor in your area who can probably fill your order directly from stock.

SPECIFY CHANCE FOR SERVICE!

A·B·CHANCE CO·

CENTRALIA, MISSOURI

SAN FRANCISCO, CALIFORNIA

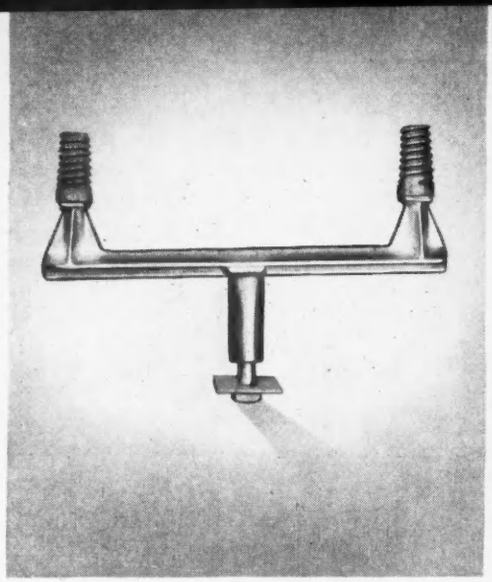
ABC INDUSTRIES

CA54-2B

It's Safe..In All Kinds of Weather — Copperweld's rugged strength resists heavy ice and wind loads. Copper, molten welded to steel, assures corrosion resistance and high conductivity. Provides economy in long-span construction. COPPERWELD STEEL CO.

•

A Tree Guard made of thermoplastic tubing, helically slit, and cut to three foot lengths —protects drop wire from abrasion where tree contacts are unavoidable. Guard can be spiraled on wire already in place. Made by DETROIT MACOID CORPORATION.



Help Eliminate Frequent Replacements with installation of Aluminum Transposition Brackets. Made of a new aluminum alloy, completely assembled and ready to install on crossarm—saving cost of assembly. PERMANENT MOLD FOUNDRY, INC.

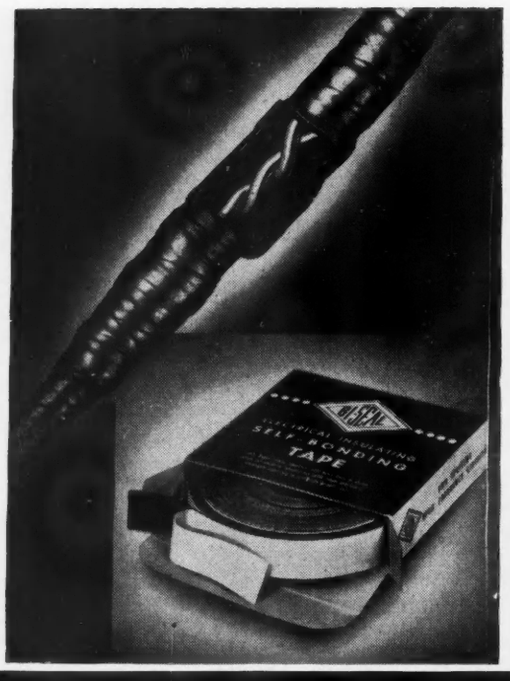
•

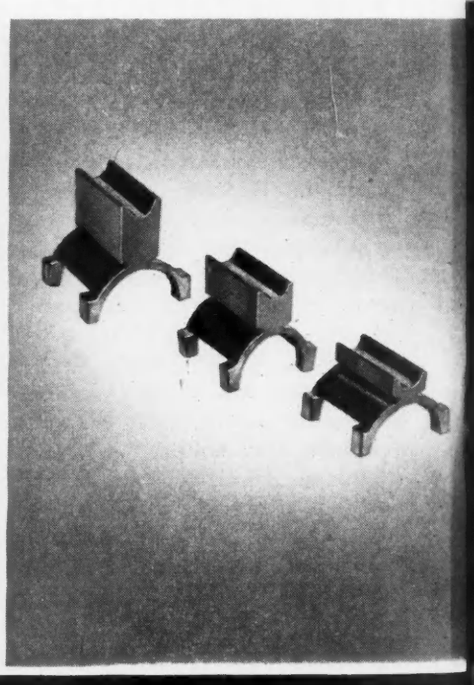
For Quick, Dependable Wire Splices—Bi-Seal, self-bonding, electrical insulating tape fuses into a solid, watertight, dielectric sheath when applied over wire and cable splices. Outstanding for low temperature applications. BISHOP MFG. CORPORATION.

The Expanding Plates and Spreader Arms of Everstick Anchors insure 100% safety and maximum holding power under excessive strain. Ribbed base plate allows anchor to be locked solidly on rod. Quickly installed. Made by EVERSTICK ANCHOR CO.

•

Lead Cable Spacers used in lashed cable construction at poles and splices — provides separation between cable and strand. Lower concave surface bears against cable; upper surface against strand. Easy to use with any size cable. O. F. KINSEL & SONS.





Send Your Next Order for Supplies To:

KELLOGG DIVISION OF I T&T

KELLOGG SWITCHBOARD AND SUPPLY COMPANY

A Division of International Telephone and Telegraph Corporation

***Sales Offices:* 79 W. Monroe St., Chicago 3, Ill.**

BRANCH WAREHOUSES AND OFFICES:

6000 W. 51st Street
Chicago 38, Illinois

410 N. Syndicate Avenue
"Midway Area"
St. Paul, Minnesota

1663 Mission Street
San Francisco 3, California

4501 Truman Road
Kansas City 1, Missouri

1515 Turtle Creek Blvd.
Dallas 2, Texas

1555 West Fourth Street
Mansfield, Ohio

BRANCH OFFICES:

406 S. Main Street
Los Angeles 13, Calif.

720 S. W. Washington Street
Portland 5, Oregon

r Arms of safety and excessive anchor to installed. CO.

cable con- provides nd. Lower le; upper with any S.

No "Canned" Talked-Out Messages are used on the Peatrophone automatic telephone answering instrument. Subscriber records message he wishes right on the Peatrophone, advising where he can be reached or when he will return. Records are permanent.

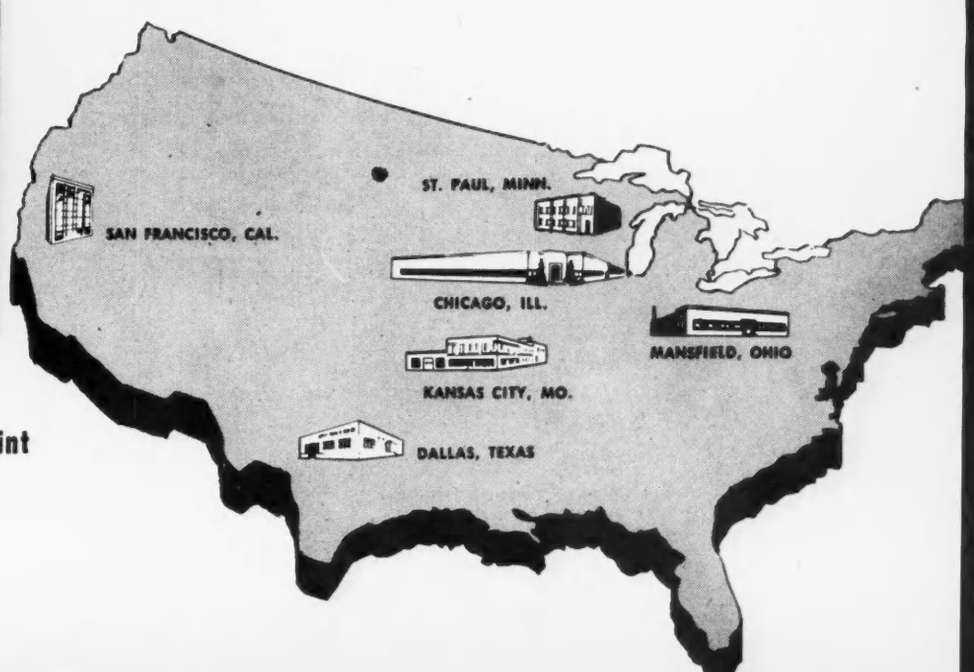
•

The Key to Clear Party Lines. The Signal tone produced by the LORAIN HOWLER demands attention; it is loud yet safe — the ideal method for getting that misplaced receiver on the hook without making a service call. LORAIN PRODUCTS CORP.

KELLOGG

HEADQUARTERS FOR SUPPLIES

You will save time and shipping costs and get guaranteed quality when you make Kellogg your only source for Line Supplies. Delivery service is fast—Kellogg has 6 conveniently located warehouses and more than 100 supplier distribution points throughout the country. Your order is shipped from the location nearest you.



Your Nearest Kellogg Shipping Point Is Never Far Away!

ACORN INSULATED WIRE

Quality WIRE for Every Telephone NEED

DROP WIRE
BRIDLE
SWITCHBOARD
TREE
GROUND
BURIED WIRE

INTERIOR
INSTRUMENT
POTHEAD
CABLE TERMINAL
FIXTURE
PLASTIC INSULATED

ACORN INSULATED WIRE CO., INC.
36 Freeman St., Pawtucket, Rhode Island
LEICH SALES CORP., 427 West Randolph St., Chicago.
LINDSAY TELEPHONE SUPPLY CO., 7016 Euclid Ave., Cleveland, Ohio.
NORTH ELECTRIC CO., 501 S. Market St., Galion, Ohio.

Drop Wire—Bridle—Interior—Tree—Ground—Switchboard—Pothead—Cable Terminal—Instrument—Fixture—Buried Wire

THE GREATER THE PULL—
THE TIGHTER THEY GRIP

When You Use KEARNEY LAY-CIT CABLE GRIP

Lay-Cit Cable Grip is a neat compact grip that is easily and conveniently installed. Linemen can either take up or let out slack, by simply spreading the plates and adjusting the lacing.

They do not mar the insulation, and can be used over and over. Available in two sizes to handle cables from 3/8 to 1 1/8 inch.

Now ready for IMMEDIATE DELIVERY. For complete information and prices see your regular jobber or write —

JAMES R. KEARNEY CORPORATION ST. LOUIS MO.

JAMES R. KEARNEY CORPORATION
4236 CLAYTON AVE. • ST. LOUIS 10, MO.
Overhead and Underground Utility Equipment

sion's Technical Department which operates development and control laboratories in Orrville, Ohio. His successor as head of the Technical Department will be Dan L. Davies, who has been assistant manager in charge of sales service and quality control.

As Pittsburgh District Manager, Mr. Bescher will be responsible for sales, operations, and procurement in an area embracing the western portions of Pennsylvania, New York, West Virginia, Virginia, Florida and Georgia, all of Ohio and Alabama, and eastern Kentucky. Included in the district are seven plants which pressure-treat railroad cross ties, utility poles, piles, timber, lumber and other wood products.

Leeds & Northrup Announces Organization Changes

LEEDS & NORTHRUP Co., Philadelphia, Pa., has announced the promotion of two sales field engineers to district managerships, a change in territory for another manager, and the opening of a new branch office in Milwaukee, Wis. The Philadelphia company manufactures electrical measuring instruments, automatic controls, and heat-treating furnaces.

Wilson D. Trueblood, Jr., formerly in the Leeds & Northrup Chicago office, becomes district manager of the new five-man office at 828 North Broadway, Milwaukee, which will serve all of Wisconsin and Minnesota, the northern peninsula of Michigan, North and South Dakota east of the Missouri River, and the Canadian provinces of Manitoba and western Ontario.

Trueblood joined Leeds & Northrup in 1924, after graduating from the University of Wisconsin, and for some years has been representing his firm in the area covered by the new office. He is a member of Tau Beta Pi, Phi Lambda Upsilon, and Alpha Chi Sigma, and is vice-chairman of the Milwaukee chapter, American Society for Metals.

Edwin A. Yeo, for 16 years the firm's Cincinnati manager, becomes manager at Pittsburgh. Mr. Yeo, who joined L & N in 1928, replaces the late Harold S. Vecella, long-time L & N sales executive there.

Willard H. Neu, formerly a sales field engineer in the Leeds & Northrup Pittsburgh office, becomes district manager at Cincinnati. He joined the firm in 1935 after graduating

from John Hopkins University. He is a member of Alpha Tau Omega, and has been secretary of the Pittsburgh chapter, American Society for Metals.

Richard Friehe, New Leich District Sales Manager

LEICH SALES CORP., Chicago, Ill., has announced the appointment of Richard Friehe to the position of district sales manager.

Before coming to Leich Mr. Friehe

RICHARD FRIEHE, district sales manager of the Leich Sales Corp., Chicago

was with the Cook Electric Co., Chicago, manufacturer of telephone protection equipment.

At Cook, Mr. Friehe was supervisor of expediting until April, 1951 when he was made assistant manager of the Wirecom & Telephone Division.

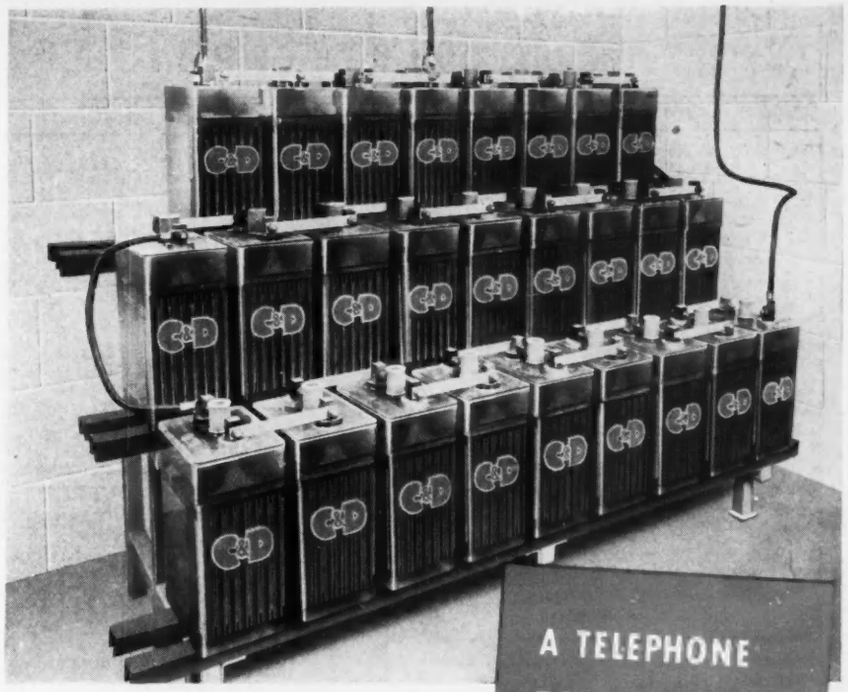
In this capacity he traveled throughout the United States and came to know telephone company operations very well.

Mr. Friehe (he prefers to be called Dick) was in the United States Navy Air Corps during World War II and served in the Pacific as an aviation radio man.

Trade-Marks Adopted For New Weed-Killer Family

TWO TRADE-MARKS have been adopted by the Du Pont Company to identify its substituted urea herbicides. This family includes CMU weed killer and a number of related compounds.

Agricultural herbicide formulations of these compounds will bear the trade-mark "Karmex," while the trade-mark "Telvar" will apply to



Typical PlastiCal telephone battery installation of 420 A.H. capacity at the Lorain Telephone Company, Lorain, Ohio.

A TELEPHONE BATTERY CASE THAT'S . . .

STRONG!
LIGHT!
DURABLE!
COMPACT!

C&D pioneered in using plastic cases to give telephone batteries added strength, lightness, compactness, and durability. Regardless of whether you prefer conventional grids (PlastiCell) or lead-calcium grids (PlastiCal) you can have the advantages of a plastic case in a C&D telephone battery.

YOU GET THESE ADVANTAGES!

1. *One-piece case. Jar and cover are "Plastifused"—permanently sealed together.*
2. *Shock-resistant case is lighter and more compact than glass or rubber.*
3. *No sudden leaks due to internal stresses. Case and cover are heat-treated after molding to eliminate internal stress.*
4. *Easier maintenance, because patented Post Seal eliminates acid creepage. Electrolyte level can be checked at a glance.*
5. *Lower shipping costs. Lightness of plastic case reduces your total "in-place" cost.*

C&D BATTERIES, INC. of Conshohocken, Pa.
Manufacturers of Industrial Batteries since 1906

You can order C&D telephone batteries, either PlastiCal or PlastiCell, from all leading suppliers of telephone equipment. For details and specifications write for Bulletins T-527 and T-528.

SALES AND SERVICE OFFICES IN PRINCIPAL CITIES FROM COAST TO COAST

Professional Services

CYRUS G. HILL
ENGINEER
Plant—Traffic—Commercial
Valuations and Original Cost
134 S. LaSalle St., Chicago 3

PENN LINE SERVICE
Scottdale, Pa.
Phone 765 or 686
CREWS
Construction — Trimming
Station Installers — Cable Splicing
Chemical Spraying
Right of Ways

MURER & SMITH
ENGINEERS & CONTRACTORS
Engineering—Construction—Installation
A complete service to the Telephone, Electrical and Pipe Line operating companies.
440 S. Brentwood Blvd. Clayton 5, Mo.
St. Louis Telephone Parkview 2747-7282

Construction Crews — Station Installers
Central Office Installations
Cable Splicers — Complete Engineering
HENKELS & McCOY
6100 N. 20th St., Philadelphia 38, Pa.
Now Operating in 18 States

SPECIALISTS ○ *Our 45th Year*
TELEPHONE FORMS
PRINTING • PLANOGRAPHING
YOUR ORDERS RECEIVE PROMPT ATTENTION
CULLOM & GHERTNER CO.
600 21st AVE., N. NASHVILLE 4, TENN.

JAY G. MITCHELL
CONSULTING ENGINEER
APPRAISALS—COSTS—PLANT
7720 SHERIDAN ROAD CHICAGO
FOR MAIL BOX 523 EVANSTON, ILLINOIS

CARL C. CRANE, INC.
Consulting Engineers
2702 Monroe Street, Madison 5, Wis.
Experienced in REA Procedures
Preallotment Surveys—Specifications
Design and Construction Supervision

CABLE
Splicing Placing
- Excellent References
- Years of Experience
- Expert Splicers

Serving Missouri and adjoining states
DAVIS CONSTRUCTION CO., Sullivan, Mo.

Installation Specialists
CENTRAL OFFICES
Installed-Modified-Removed
All Makes
COMMUNI-CATERING
P. O. Box 6712
CHICAGO 7, ILLINOIS

INTERNATIONAL ELECTRONICS ENGINEERING, INC.
RADIO SITE SURVEYS
SYSTEMS DESIGN
INSTALLATION PLANNING
INSTALLATION SUPERVISION
RESEARCH AND DEVELOPMENT
1612 K STREET N. W.
WASHINGTON 6, D. C.

H. GEMAR'S ELECTRIC SERVICE
Complete Outside Telephone Plant Construction
You name it, and we can do it
We can satisfy because of our many years of experience
Rt. 4, Box 398 Lodi, California
PHONE 9-4944

EDWIN T. MAHOOD
Consulting Telephone Engineer
627 W. 67th St. Kansas City 5, Mo.
Jackson 4452

W. T. KING
PROF. ENGR. — TELEPHONE CONSULTANT
Engineering, Accounting, Valuations, Traffic Depreciation Studies, Rates and General Management Services
306 So. Capitol Lansing, Mich.
P. O. Box 216 Telephone 5-1034

B. O. VANNORT ENGINEERS
Incorporated
Electrical—Civil—Mechanical
Telephone
A complete engineering service
700 South College Street, Charlotte, N. C.

Cedar Poles
THE MAC GILLIS & GIBBS CO.
1615 E. Royall Place, Milwaukee 2, Wis.
Northern White and Western Red Cedar
Creosote and Pentachlorophenol Treatments

TELEPHONE PRINTING
By People Who Know the Telephone Business.
See the Suttle Catalog
SUTTLE EQUIPMENT CO.
LAWRENCEVILLE ILLINOIS

J. E. ALBERT
Engineering & General Consultant
Telephone Company
Financing, Purchase, Sale
185 N. Wabash Ave. Chicago 1, Illinois

TELEPHONE CONSTRUCTION, INC,
Consulting, Engineering, Installation,
Good Machinery, Competent Workmen
Pole Digging and Cable Splicing
C. H. DAUBENDIEK
Secretary
Box 267, Telephone 012, JEFFERSON, IOWA

SLOAN, COOK & LOWE
CONSULTING ENGINEERS
Suite 1344 120 South LaSalle Street
CHICAGO
Appraisals—Original Cost Studies
Depreciation, Financial, and Other Investigations

INSPECTION SERVICE
Of poles, crossarms, and preservative treatments. Analyses of wood preservatives. Consulting and specification writing. Inspectors stationed throughout U. S. A.
A. W. WILLIAMS INSPECTION CO.
MOBILE, ALABAMA
OVER 30 YEARS EXPERIENCE

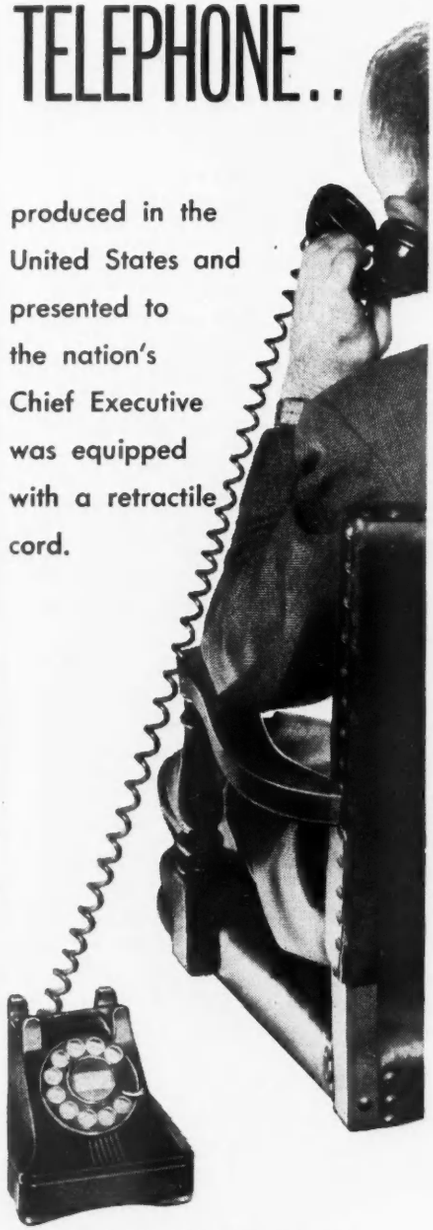
D. J. NEALE
Telephone Engineer
Complete Outside Engineering, Construction, Maintenance and Planning
Nationwide Service
Topeka, Kansas Telephone 4-2621

PINS AND BRACKETS
Manufacturers of all sizes Locust Pins, Oak Brackets, Locust Bushings.
REA Approved.
L. H. WIEBEL, INC.
Charlottesville Virginia

For Best Results
Advertise in
Telephone Engineer
& Management

THE 50 MILLIONTH TELEPHONE..

produced in the United States and presented to the nation's Chief Executive was equipped with a retractile cord.



KEEP IN STEP...

Specify Koiled Kords on all new telephones and use them for replacements.

Koiled Kords
INCORPORATED

Box K, New Haven 14, Conn.

the industrial weed killer formulations.

"Karmex" W herbicide now identifies the 80 per cent formulation of CMU currently being offered for selective weed control in asparagus, sugar cane and pineapple, and for general use in agricultural areas where complete control of vegetation is desired. The chemical name for CMU is 3-(p-chlorophenyl)-1, 1-dimethylurea. In this product name, the "W" identifies the formulation as a wettable powder.

Another agricultural formulation, "Karmex" DL herbicide, will be available in limited quantities in some areas for pre-emergence weed control in cotton this year. The "D" indicates that the active ingredient is 3-(3, 4-dichlorophenyl)-1, 1-dimethylurea. The "L" means it is a liquid suspension.

"Telvar" W weed killer now identifies the CMU formulation which has had wide industrial use with outstanding results over the past two seasons. This product is designed and packaged for custom applicators and industrial users for application where the objective is complete control of vegetation for an extended period of time. Examples of such applications include railroad yards, oil tank farms, security fence-lines, power stations, fuel storages, and lumber-yards. Here again, the "W" identifies it as a wettable powder.

Industrial trials of "Telvar" DW weed killer are also planned this year. Again, the "D" indicates that the active ingredient is 3-(3, 4-dichlorophenyl)-1, 1-dimethylurea, and the "W" means it is a wettable powder.

Supplies of these products, labelled with the "Karmex" and "Telvar" trade-marks, are expected to be in the hands of distributors and dealers in time for the 1954 use season.

Harry Hershey Retires After 43 Years

HARRY E. HERSHEY, supervisor of Technical Publications of the Automatic Electric Co., Chicago, retired January 31 after 43 years of service with the company.

When he joined Automatic Electric in 1910, Mr. Hershey was assigned to the factory on switch adjusting. He learned the finer points of automatic exchange operation while working for an Independent company at Cambridge, Ohio. Then

OK chief... installation completed!

"These Runzel cords sure are easy to install."

Runzel... Precision made

TELEPHONE CORDS

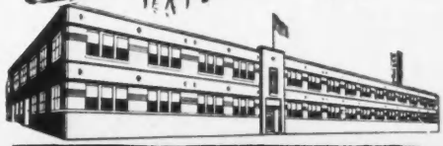
Precise in every detail... leg length, trim, terminals, tracer color and stay fastener... Runzel cords make installation a routine matter. Installers like them because they simplify their work.

Subscribers prefer Runzel cords because of clarity of reception and the longer, trouble-free service they give.

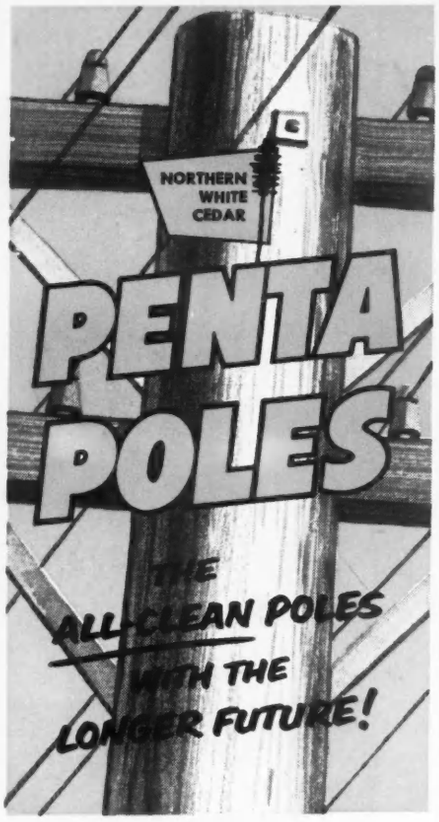
There's a Runzel cord for every type and make of instrument.

Write for your copy of Runzel Telephone Cord Catalog.

Operators too, prefer Runzel Cords.



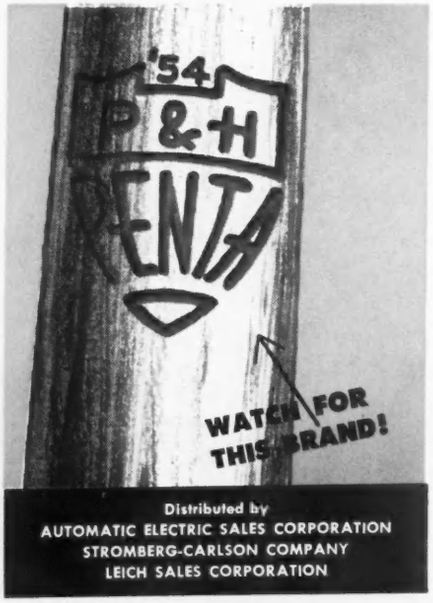
RUNZEL
Cord and Wire Co.
4723 W. MONTROSE AVE.
CHICAGO 41, ILL.



Whenever maintenance costs go down, company profits go up! P & H Northern White Cedar Penta Poles, treated from top to butt give longer trouble-free service. Clean, safe, easy to handle, they build public good-will wherever installed.

Before you buy . . .
Get the complete story!
WRITE FOR OUR FREE PAMPHLET
"Full-Length Treated Northern White Cedar P & H PENTA POLES,"
TODAY!

PAGE & HILL, INC.
MINNEAPOLIS 2, MINNESOTA
50 CHURCH STREET • NEW YORK CITY, N.Y.



Distributed by
AUTOMATIC ELECTRIC SALES CORPORATION
STROMBERG-CARLSON COMPANY
LEICH SALES CORPORATION

he was sent on a series of installation jobs.

In 1915 he joined the Tri-State Telephone & Telegraph Co. at Minneapolis-St. Paul, which at that time was installing the largest automatic network yet to be placed in service. There he taught the principles of automatic telephone operation to Tri-State personnel.

Shortly after this he first published his book, "Automatic Telephone Practice," now in its seventh edition.

During World War I he served as a signal officer in an infantry division.

Returning to Automatic, he spent some time in Factory Inspection, then went to the Laboratories as a circuit designer for 12 years. During this time he was granted 58 U. S. patents for his inventions.

Since 1938 he has been head of Automatic Electric's Technical Publications group.

Mr. Hershey received his B.S. and E.E. degrees from Kansas State College, and his L.L.B. and Juris Doctor from John Marshall Law School. He is a member of the Illinois and the American Bar Associations, and a life member of the American Institute of Electrical Engineers and the Western Society of Engineers.

Mr. Hershey's plans following retirement are indefinite, but he is considering engaging in engineering consultation in communications.

Stromberg-Carlson Holds Telephone Sales Meeting

STROMBERG - CARLSON telephone salesmen were greeted by J. H. Voss, general manager, at their annual three-day sales conference in the Seneca Hotel, Rochester, N. Y., Jan. 13. Sales records for the Telephone Division were 57% ahead of the previous year and set an all-time high for the company which this year celebrates its 60th anniversary, according to T. C. Thompson, sales manager.

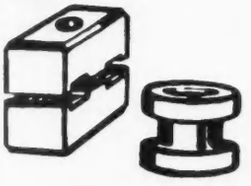
Mr. Voss recounted the experience of seeing the largest Stromberg-Carlson dial telephone installation which was cut into service on Jan. 9, at Kingsport, Tenn., home of Tennessee Eastman. This exchange consists of two offices, 14,000 terminals and 24 positions of toll board. Other company officials attending included A. F. Gibson and W. M. Angle, but R. C. Tait, president, was unable to get through as

JOHN H. VOSS

his plane was grounded by a snowstorm which paralyzed the eastern seaboard.

More than 50 salesmen and sales engineers spent the three days studying the company's telephone products and visiting the main office and factory where thousands of persons are employed in turning out the company's telephone products. Recent addition to the Stromberg-Carlson Telephone Division include the

"C" "PORCELAIN" "S"
PRODUCTS
KNOBS



PARAGON KNOBS

For decades Porcelain Products C and S knobs have set the standards for insulator quality and service in the telephone industry. They help you maintain your reputation for *reliability*. The same is true of Porcelain Products complete and diversified line of telephone insulators. Available through your jobber Ask him for your copy of our reference booklet on telephone insulators, or write direct.

SCREW EYES
T KNOBS
No. 6062
No. 6061

STRAINS TREE KNOBS No. 4-2 GR. TUBES

PORCELAIN PRODUCTS, INC.
FINDLAY, OHIO

acquisition of the Southern Electric & Transmission Co., Dallas, Texas, manufacturer of wire carrier equipment. W. W. Weedfall, manager of this division attended the sessions. Also in attendance was C. H. Knapp, industrial sales manager, who is setting up a new operation to sell the company's telephone products to industrial users.

Exide Announces Three Promotions

THE PROMOTION of three executives was announced recently by Roland Whitehurst, vice president and manager of The Electric Storage Battery Company's recently formed industrial products division. The company manufactures Exide batteries for numerous industrial applications, including emergency lighting, switchgear, telephone stand-by and fire alarm equipment, railway signaling, and car lighting and air conditioning, as well as motive power for materials handling trucks and mine locomotives.

C. J. Moore, former manager of railway and motive power sales, has been made industrial products sales manager. W. E. Nyce has been appointed manufacturing manager, industrial products. L. E. Wells, former chief engineer, has been made director of research and engineering, industrial products. They will report to Mr. Whitehurst.

The three bring to their new positions experience in the storage battery industry totaling almost 100 years. Mr. Nyce has been with the company 41 years, Mr. Wells over 36, and Mr. Moore since 1935.

Smokeless Salamander Offers Operational Advantages

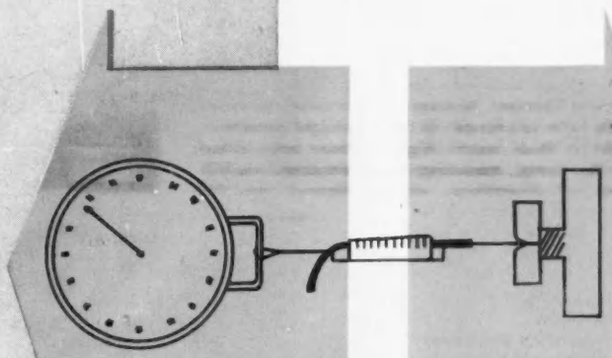
DESIGNED FOR efficient spot and space heating jobs inside and out-of-doors, the HY-LO oil burning salamander offered by Scheu Products Co., Upland, Calif., is highly flexible because it is easily moved and regulated to produce the right amount of heat where it is needed.

The heater's smokeless efficiency is based on a patented return gas stack principle. According to the manufacturer the stack returns consumed gases to the bowl, thus producing better combustion and eliminating carbon. Almost perfect combustion gives a greater abundance

Please turn to page 114

ALPHADUCT

P clamp adhesion test



The conductor must break before it slips

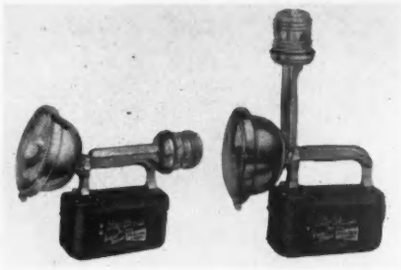
P clamps are the most widely used method of attaching drop wire to buildings. Lest you may worry about a P clamp causing slipping of the insulation or jacket on Alphaduct Neoprene Jacketed Drop Wire — read about this Alphaduct service test. This test is made daily.

A sample of Alphaduct wire is inserted in a P clamp with 12 inches of the wire projecting from the top of the clamp. The bail of the clamp is then inserted in the upper jaws of a tensile testing machine, and the end of the wire is stripped free of jacket and insulation and inserted in the other end of the machine.

The jaws of the machine are then gradually separated until the conductor breaks. The conductor must break before there is ANY slipping of either the jacket or the insulation.

Don't have any worries about a little old P clamp hurting ALPHADUCT drop wire. Try Alphaduct. It's dated by a color coded thread so you can see for yourself how long it lasts, how much money it saves.

ALPHADUCT WIRE AND CABLE COMPANY • MILLTOWN, NEW JERSEY
NATIONAL DISTRIBUTORS • LEICH SALES CORPORATION, CHICAGO, ILLINOIS
REGIONAL DISTRIBUTORS • PANKEY SUPPLY CO., CHARLOTTESVILLE, VA.
THE LINDSAY TELEPHONE SUPPLY CO., CLEVELAND, OHIO



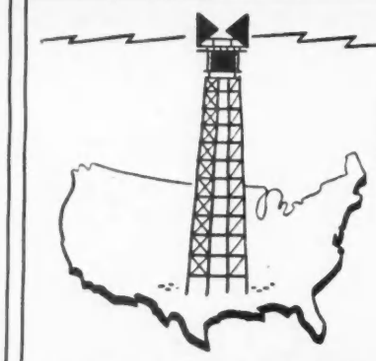
PORTABLE HAND LAMP: — A new combination portable electric hand lamp and flashing red beacon has been added to the Big Beam line of hand lamps, electric flares, and automatic emergency lights produced by U-C Lite Manufacturing Co., 1050 West Hubbard St., Chicago 22, Ill.

The new Beacon Lamp, available in both sealed beam (No. 164) and standard bulb type (No. 104) models, features the Big Beam exclusive two-position flashing beacon. When the beacon arm is folded down, it fits snugly over the handle. In this position, the flashing bulb covered with a red Fresnel lens of molded plastic serves as a tail light. When carried in this manner, the Beacon Lamp not only lights the way ahead but also flashes a warning to vehicles approaching from the rear.

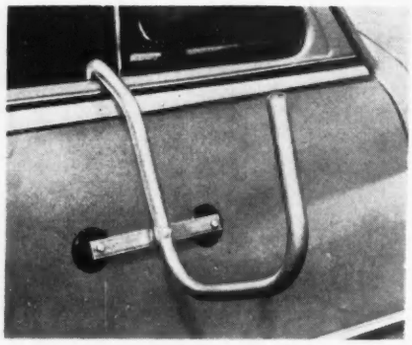
The red flasher becomes a tower beacon when the arm is raised to the upright position. The light is then much higher than any other part of the lamp, assuring unobstructed visibility from all directions when placed on the ground or on top of an automobile.

Because the lamp and beacon operate either independently or together, the Beacon Lamp can be used as a hand lamp only, as an emergency or signal light only, or as a combination of these two.

The lamp and beacon are powered by one standard six-volt lantern battery housed in a sturdy steel case finished in red baked enamel. Battery replacement can be made in a very few seconds because there are no wires to connect. Lamp-to-battery contact is pressure type. —For Complete Data, Check New Product 597.



NEW PRODUCTS' SHOWCASE



AUTO CARRIER: — Every one who must occasionally carry long merchandise or tools, ladders, etc., will welcome this new Sidalong Carrier set. These Sidalong Carriers, made by the Acme Metal Products Co., 1807 E. 79th St., Chicago, Ill., hook onto the door of the car, whether the window is open or closed. Flat steel ends of tubes slide down next to glass. The suction cups on the cross bar not only hold the carrier hooks from swinging but they so cushion the load that it does not touch or injure the finish of the car.

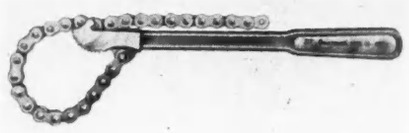
To mount on any car just slip the flattened end of the steel tube in the window slot, press down on the vacuum cups — and load up. The 12-inch span of the hook will carry, safely, any ladders, pipe, lumber, poles, light scaffolding, or any other items too long for a car. No danger of bouncing off or swinging loose. For folder Check New Product 598.

TELEPHONE NUMBERING LABELS: — An interesting new use for Avery Kum-Kleen self-adhesive labels saves telephone companies thousands of dollars in service calls, according to John S. Torrey, sales manager of Avery Adhesive Label Corp., Monrovia, Calif.

At present a number of telephone companies of the Bell System are in the process of setting up a new "two-five" dialing system and new numbers must be assigned to all the subscribers in the areas. This normally requires a service call to every subscriber to replace the old number card with a new one. The whole unit (number card, metal housing, acetate cover, and metal backing) costs between $.37 and $.53 per set — plus the service call which averages about $2.00.

With the telephone company's new numbering method, every subscriber is mailed a new number on an Avery Kum-Kleen Label, which the subscriber applies himself. The simplicity of application of these Avery Labels makes this especially practical. The user just rolls the backing tape away from the self-adhesive label and applies the new telephone number label right over the old card in a matter of seconds.

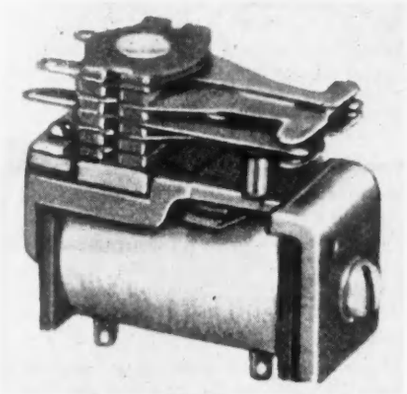
According to Mr. Torrey, the total cost, using the new Avery Label method, is less than $.10 per customer, which makes a very substantial saving compared with the previous $2.37-$2.50 average. In a few small towns in Connecticut alone, savings are reported to be over $200,000.00, and even greater reductions are expected in other areas where quantities are larger. Installations and Avery Kum-Kleen Labels are now being made or have been completed in Los Angeles, Denver, Boston, St. Louis, Jacksonville, Florida, Atlanta, Erie, Penna., and other cities.—For complete Check New Product 599.



RATCHETING CHAIN WRENCH:—An exceptionally versatile tool has been announced by the Owatonna Tool Co. Because of its ability to operate in close quarters — in corners or up against a wall — it will work where a conventional pipe wrench cannot be used. In addition, it operates equally well on round, hexagonal or octagonal material and need not be taken off the work to obtain a new bite. The tool is an extremely handy tool for anyone who installs or removes conduit or piping.

The 12" long drop-forged, alloy steel handle is fully heat treated for strength while the spiral chain is designed to withstand 6000 pounds. The 15" chain enables the operator to handle any size pipe or conduit

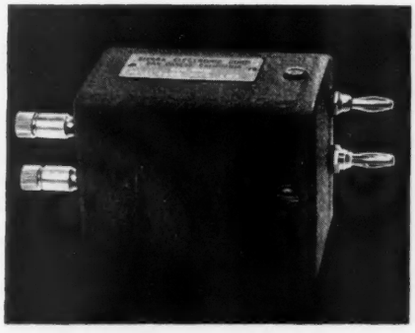
from 5/8" to 4½" OD and thus actually has a greater capacity than four pipe wrenches.—For Complete Data, Check New Product 600.



TELEPHONE TYPE RELAY: — The new Midget Telephone Type Relay (Series 80) was the answer to the great demand in recent years for miniature relays that are sensitive yet able to function under severe operating conditions in a multitude of electronic applications, according to the Signal Engineering & Manufacturing Co.

The Series 80 Relay, a compact, multiple contact relay with vibration and shock-proof characteristics, is designed to meet rigid government specifications. Coil windings are rated for DC voltages up to 115 volts. The contacts are palladium and rated at 3 amperes non-inductive load at 24 volts DC or 115 volts, 60 cycles. On special order, they can be supplied with silver contacts which are rated at 5 amperes.

The Midget Telephone Type Relays are available in open form for surface mounting or in hermetically sealed containers. The 8614 type, the smallest, in the sealed types, measures 1 5/8" x 1 1/32" x 1 21/32". For complete details, Check New Product 601.



LINE-BRIDGING TRANSFORMER: — A new low-cost line-bridging transformer that converts most makes of voltmeters from single-ended to balance input is now offered by Sierra Electronic Corp. The new transformer, Sierra Model 122, plugs into input terminals of Sierra and other makes of voltmeters, and is compensated so readings are corrected for the transformer's small insertion loss.

Model 122 is supplied for bridging measurements on systems of the following impedances: Model 122A, 135 ohms; Model 122B, 500 ohms and Model 122C, 600 ohms. Each comprises a broadband ferrite core unit operating flat within 0.5 db from 15 kc to 500 kc. All models are identical in size, measuring 2" x 3" x 4" and housed in a lightweight aluminum case with plug-type input binding posts and banana-plug output terminals.

For further information, write Sierra Electronic Corp., 1050 Brittan Avenue, San Carlos 2, Calif., requesting Bulletin 103, or Check New Product 602.

THE BUYERS' GUIDE

ADVERTISING, Directories — Planning, Selling, Compiling, Producing, Publishing and Distributing — backed up with over 43 years of Directory Experience and Knowledge. Write or call *L. M. Berry & Co., Hulman Bldg., Dayton, Ohio.*—[ADV. 1]

ADVERTISING, Directories — *General Telephone Directory Co., 604 Pine Ave., Long Beach, Calif., and 1800 Busse Highway, Des Plaines, Ill.*—[ADV. 2]

BELTS — CLIMBERS — COMPLETE LINEMEN'S EQUIPMENT, *W. M. Bashlin Co., Bashlin Bldg., Grove City 1, Pa.*—[ADV. 3]

BELTS — CLIMBERS — PLIERS — SAFETY STRAPS — CONSTRUCTION TOOLS. *Klein & Sons, Mathias. 3200 Belmont Ave., Chicago 18, Ill.*—[ADV. 4]

BOOTHS—Acoustic Telephone — *Sherron Metallic Corp., 1202 Flushing Ave., Brooklyn 6, N. Y.*—[ADV. 5]

BRUSH & WEED KILLERS — *Thompson manufactures many types of brush and weed killers. Write for helpful information on specific problems. Thompson Chemicals Corp., St. Louis 3, Mo.*—[ADV. 6]

CABLE, All Plastic, Aerial, Duct, Direct Burial, PBX, Switchboard. — *The Ansonia Wire & Cable Co., Ansonia, Conn.*—[ADV. 7]

CORDS, Switchboard (with or without plugs), Instrument (retractable and regular) and Operators — *Commercial Cord & Supply Co., Inc., 26 Main St., Clifton Springs, N. Y.* —[ADV. 8]

CORDS, Switchboard & Telephone — *Runzel Cord & Wire Co., 4727-31 Montrose Ave., Chicago 41, Ill.*—[ADV. 9]

ELECTRIC HOT WATER HEATERS. *Thermostatically controlled for any hot water heater, Vulcan Electric Co., Danvers 17, Mass.*—[ADV. 10]

ENGINEER, CONSULTING — *Telephone financing — J. E. Albert, 185 N. Wabash Ave., Chicago 1, Ill.*—[ADV. 11]

FURNACES — For quickly and economically melting lead and paraffin — *Mutual Liquid Gas Equipment Co., Inc., 3600 W. Imperial Highway, Los Angeles, Calif.*—[ADV. 12]

INSULATORS, Porcelain — *Porcelain Products Inc., Box 300, Findlay, Ohio.*—[ADV. 13]

LIGHTWEIGHT PULLERS — *Coffing Hoist Company, 800 Walters St., Danville 5, Ill.*—[ADV. 14]

PIPE PUSHERS — *Giant Manufacturing Co., South 6th St., at 12th Ave., Council Bluffs, Iowa.*—[ADV. 15]

POLE HOLE DIGGERS — *For derrick mounted trucks. Tele-E-Lect Products, Inc., 9613 Minnetonka Blvd., Minneapolis 16, Minn.* —[ADV. 16]

POLES, Southern Yellow Pine — *Colfax Lumber & Creosoting Co., Inc., P. O. Box 23, Pineville, La.*—[ADV. 17]

POLES, Southern Yellow Pine — *Taylor Colquitt Company, 290 E. Main St., Spartanburgh, S. C.*—[ADV. 18]

POLES, Southern Yellow Pine — *Texas Creosoting Co., Orange, Texas.*—[ADV. 19]

PROTECTIVE EQUIPMENT — *Reliable Electric Company, 3145 Carroll Avenue, Chicago 12, Ill.*—[ADV. 20]

REBUILT TELEPHONE & SWITCHBOARDS — *Telephone Repair & Supply Company, 1760 Lunt Avenue, Chicago 2, Ill.*—[ADV. 21]

TRUCK BODIES — *Highway Trailer Co., Edgerton, Wisc.*—[ADV. 22]

WIRE, Insulated — DATED DROP WIRE — Neoprene or Weatherproof — *Alphaduct Wire & Cable Co., Milltown, N. J.*—[ADV. 23]

WIRE, Insulated Drop and Bronze or Copperweld — *Acorn Insulated Wire Co., Inc., 36 Freeman St., Pawtucket, R. I.*—[ADV. 24]

WIRE, Telephone, for all inside and outside uses — *Whitney Blake Co., New Haven, Conn.*—[ADV. 25]

For complete information on the products and services described in this department send in the coupon which appears on this page. If you do not see a listing of the products and services that you are interested in, write BUYER'S GUIDE, 7720 N. Sheridan Road, Chicago 26, Ill. The information will be furnished quickly and without charge to telephone industry members.

SEND IN THIS COUPON FOR MORE INFORMATION

Telephone Engineer Publishing Corp.
7720 N. Sheridan Road
Chicago 26, Illinois

Please forward complete information on the following products and services described in the February, 1954 issue of TELEPHONE ENGINEER & MANAGEMENT (Check Information desired.)

NP 597 NP 598 NP 599 NP 600 NP 601 NP 602

SERVICES AND SUPPLIES

ADV. 1	ADV. 2	ADV. 3	ADV. 4	ADV. 5
ADV. 6	ADV. 7	ADV. 8	ADV. 9	ADV. 10
ADV. 11	ADV. 12	ADV. 13	ADV. 14	ADV. 15
ADV. 16	ADV. 17	ADV. 18	ADV. 19	ADV. 20
ADV. 21	ADV. 22	ADV. 23	ADV. 24	ADV. 25

Name ..... Title .....

Company .....

Street Address .....

Town ..... Zone ..... State .....

EMPLOYEES
POSITIONS
SERVICES

THE CLEARING HOUSE

FOR SALE
OPPORTUNITY
EQUIPMENT

Published in each issue of **Telephone Engineer & Management**. Advertising forms close on 1st of month. Rates—15 cents a word except for Situation Wanted ads, which are only 10 cents per word. In figuring cost of ads, count each word of address in number of words used. All ads payable in advance. Minimum charge—$2.00. Special rates for display ads on request. Send copy and box number replies to Telephone Engineer Publishing Corp., 7720 N. Sheridan Road, Chicago 26, Ill.

POSITION WANTED

POSITION WANTED
EXECUTIVE desires relocation. Experienced in exchange and outside plant planning, installation and maintenance; traffic engineering; staff, budget and stock control. Please write Box 8876, Telephone Engineer Publishing Corp., 7720 Sheridan Road, Chicago, Ill.

OUTSIDE PLANT SUPERVISOR or Manager desires position. Seven years experience in engineering and construction with Bell, Independent and contracting companies. E. E. Degree, excellent references. Minimum salary, $6,500. Write Box 8877, Telephone Engineer Publishing Corp., 7720 Sheridan Road, Chicago, Illinois.

ATTENTION — Young Man with 19 years of telephone experience. Experienced in manual and dial plant, also outside construction work, plant superintendent and manager of Class B Telephone Company. Desiring position in Missouri, Kansas or Oklahoma. Will be glad to furnish record of past experience and education. Box 8871, Telephone Engineer Publishing Corp., 7720 Sheridan Road, Chicago, Ill.

HELP WANTED

SALESMEN

Experienced in Telephone Supplies, Automatic Switchboards and Equipment.

Company car furnished, salary, expenses.

Territories open—North Carolina, Virginia, Wisconsin, North Dakota, South Dakota.

Write Box 8872,

TELEPHONE ENGINEER PUBLISHING CORP.
7720 Sheridan Road Chicago, Ill.

CABLE SPLICERS, Equipment Installers, Station Installers, Linemen. Experienced men needed. Steady work, good pay. Henkels & McCoy, 6100 N. 20th, Philadelphia, Pennsylvania.

TELEPHONE ACCOUNTANT — WANTED IMMEDIATELY. Excellent permanent position for experienced telephone accountant under 40. Submit resume of education, experience, age, salary requirements. Box 8878, Telephone Engineer Publishing Corp., 7720 Sheridan Road, Chicago, Illinois.

FOR SALE

GN 38
Generator
Used on Switchboard BD 70, BD 71, BD 72 and Field Telephone EE8
600 Brand New at $4.00 ea.
TALLEN CO., INC.
159 Carlton Ave.
Brooklyn 5, New York

LIMITED SUPPLY (Used) SUBCYCLE RINGING MACHINES
Input, 115-V-AC-60 Cy. Output, 20 cycles.
Small PBX Type ..... @ $30.00
Large Type ..... @ $45.00
Prices FOB Chicago, Ill
Independent Telephone Repair Co.
2137 West 21st. St. Chicago 8, Ill.

RECONDITIONED

Western Electric No. 1268-A and No. 1269-A Central Office Protection (20 per strip) complete with heat coils and carbons.

Paystations (post pay types) No. 11, No. 11-J, No. 14, No. 23-A and No. 23-J. Refinished with baked on black enamel.

BUCKEYE
TELEPHONE & SUPPLY CO.
1250 Kinnear Road Columbus 21, Ohio
Kingswood 0655

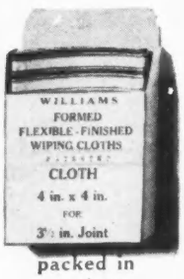
FOR SALE: Western Electric 105 B Magnetic Switchboard E/W 90 Subscribers Line Circuits 15 toll and rural lines, New, 1947. Valley Head Telephone Company, Valley Head, Alabama.

SPECIFY **TELERING** for
Dependable and Economical Telephone Ringing Power Equipment.
Engineered for complete satisfaction.
Manufactured by
TELKOR, INC. Elyria, Ohio

Write Today for Your Copy..

Bashlin's new bulletin giving full details on Linemen's Safety Equipment is ready for you . . . a complete line from which to choose, and every one a champion. Write today!

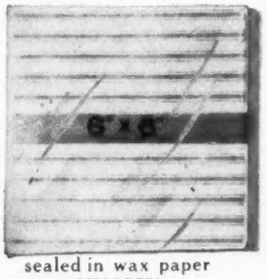
W. M. BASHLIN CO. Grove City 1, Pa.



packed in cartons

Cable-Splicers
WIPING CLOTHS

Formed-flexible finishing cloths; (Patented); Flat finishing cloths; Catch cloths; Crotch cloths and Up-right joint catch cloths. Made of world-prize HERRINGBONE TICKING or imported English MOLESKIN. Write for literature and prices.



sealed in wax paper wrappers

GEO. E. WILLIAMS, CO.
3035 Aldrich Ave., MINNEAPOLIS 8, MINN.

FOR SALE
CENTRAL OFFICE EQUIPMENT

We can make prompt shipment from Florida of a Stromberg-Carlson Switchboard, recently taken out of service, consisting of — Six Positions of 1200 lines capacity, Common Battery Stromberg-Carlson Universal Super Service Multiple Switchboard . The Switchboard now has 633 Common Battery lines, 20 Toll Lines, 75 Cord Circuits and Automatic ringing.

The Switchboard may be removed by purchaser or by our workman. Blue Prints and full details available.

— Write or Phone Rogers Park 4-3817 —

Telephone Repair & Supply Co.

1760 Lunt Ave. Chicago 26, Illinois

BURGLAR ALARM BUSINESS

Newark, N. J. and vicinity. Customers under Contract, one to five years. Net annually, 12 to 15 thousand.

ADVANCE BURGLAR ALARM CO.
65 Magnolia St. Newark, N. J.

MAGNETO WALL

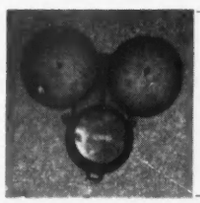
3 Bar. 1000 Ohm. @ $18.00
4 or 5 Bar. 1600 or 2500. @ $20

Prices F.O.B. Chicago, Ill.

INDEPENDENT TELEPHONE REPAIR CO.
2137 W. 21st St., Chicago 8, Ill.

For Sale — Magneto exchange in Midwest. 400 stations, good toll. Plant in good shape. Box 8873, c/o Telephone Engineer Publishing Corp., 7720 Sheridan Road, Chicago, Ill.

FOR SALE: 100 station telephone company, with or without modern home, in Southwestern Wisconsin. Write Box 8875, c/o Telephone Engineer Publishing Corp., 7720 Sheridan Road, Chicago, Ill.



Rebuilt, Refinished
Loud ringing bells. 1000 or 2500 Ohm @ $8.00 each. With Condensers @ $9.00 Each.
F.O.B. Chicago, Ill.
INDEPENDENT TELEPHONE REPAIR CO.
2137 W. 21st St.
Chicago 8, Illinois

For Sale — 6-52A— Head Sets. $10.00 each. New. Write Box 8874, c/o Telephone Engineer Publishing Corp., 7720 Sheridan Road, Chicago, Ill.

FOR SALE April 1—North Automatic Relay Board—One hundred lines. All equipment now in use and in good working condition. $20,000 worth of equipment. Reason for selling, installing larger board. If interested, come look it over and make offer. Gray Telephone Company, Gray, Georgia.

WANTED TO BUY

WANTED TO BUY — Veteran wants magneto exchange of approximately 300 stations. Would prefer leasing or managing of exchange for a year prior to purchase. Prefer Midwest or Western states. Fred M. Kruse, c/o Will Rogers Field, Oklahoma City, Oklahoma.

BUY

all the U. S. Savings Bonds you can and

KEEP

all the U. S. Savings Bonds you buy

Telephone Engineer's Research Bureau reports an expected expenditure of $1¼ billion annually during the coming three years by telephone companies in the United States for new equipment, supplies, new construction, rebuilding, etc.

Many companies will need your services . . . A Professional Card in Telephone Engineer & Management should attract the attention of those near you . Write for details.

Send A Copy To Your Friends .....Without Charge

TELEPHONE ENGINEER
PUBLISHING CORP.
7720 N. Sheridan Rd.
Chicago 26, Ill.

Please send a free copy of TELEPHONE ENGINEER & MANAGEMENT with my compliments to the persons listed below:

To .....
Address .....
City ..... State .....

• • •

To .....
Address .....
City ..... State .....

• • •

To .....
Address .....
City ..... State .....

• • •

To .....
Address .....
City ..... State .....

• • •

To .....
Address .....
City ..... State .....

• • •

To .....
Address .....
City ..... State .....

Sender .....
Company .....
Address .....

Another Outstanding Service Value From Suttle

Danish Switchboard Plugs

—all parts molded together solidly with plastic insulation that can't fail —precision machined — the most trouble-free plug you can buy at any price—red, green, and gray sleeves.

Runzel Switchboard Cords

—special flexible tinsel copper — plastic insulated conductors for waterproofing — tough, resilient nylon braiding—every specification to make them outwear old-style cords three or four times.

Put Them Together

—with matching pairs of colors for both cords and plugs — and you have one of many typical Suttle values that just make your purchase dollars go farther than you ever dreamed they could.

See Your SUTTLE Catalog

Serving Independent Telephone Men Since 1910

Suttle EQUIPMENT CO.

LAWRENCEVILLE ILLINOIS

of clean heat, and calls for less cleaning and attention even though the heater is operated at a high burning rate.

Other features claimed for the HY-LO salamander are: 70,000 to 140,000 BTU of clean heat burning from one half to one gallon per hour of any good grade fuel oil; burns 10 to 20 hours on one filling; requires no skilled attendant; handy carrying clamp-handles; lights with a match; no wicks, valves, jets or other gadgets to get out of order and an exclusive damper for quick sure extinguishing.

More information on the HY-LO salamander may be obtained from Scheu Products Co., Upland, Calif.

Homelite Advances R. J. Marschalk

R. J. "RAY" MARSCHALK has been appointed Chicago district sales manager for the Homelite Corp., it was announced last month by Nelson Thompson, Homelite's vice president and sales manager.

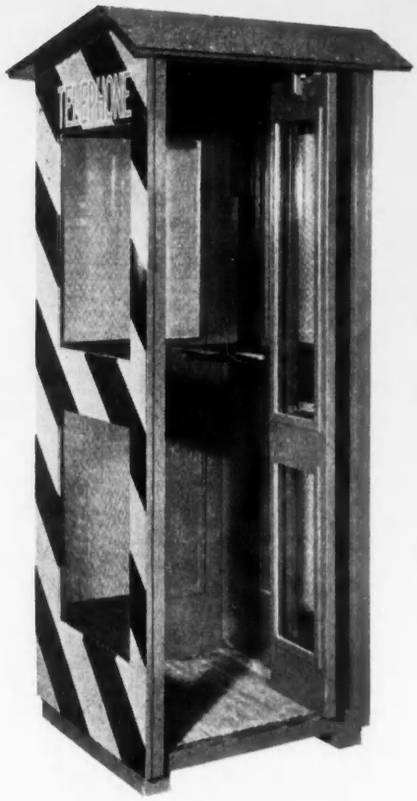
In his new position, with headquarters at 2109 Lake Street, Melrose Park, Ill., Mr. Marschalk will be responsible for the operation of Homelite's Chicago District Sales office, and for the supervision of Homelite field representatives in Milwaukee, Wis., Bloomfield, and Melrose Park, Ill.

Mr. Marschalk comes to Melrose Park from Homelite's San Francisco office where he was district manager. According to Vice President Thompson, "Ray has grown up in Homelite's tradition of *sales* and *service*. His long experience with Homelite starting in 1933, assures his emphasizing 24 *hour* service for all Homelite customers in his area.

W. B. Templeton Dies; Formed Jack Co. in 1899

WALTER B. TEMPLETON, 81, founder and formerly chairman of the board of Templeton, Kenly & Co., Broadview, Ill., manufacturers of Simplex mechanical and hydraulic jacks, died at Hinsdale, Ill., Dec. 6.

A native of Chicago, Mr. Templeton formed the jack company in 1899 with the late W. K. Kenly. He served as president of the company for 40 years until 1939 when he was named chairman of the board.



Not only TOM, DICK and HARRY *but, Sally, Irene and Mary*

and ALL the fellows and gals want 24 hour pay-station service — and that means a constant source of revenue for your company.

GIVE THEM QUALITY EARN GOOD WILL— INSTALL PHONE BOOTHS BY

Churchill

All CHURCHILL BOOTHS Distributed by

- Automatic Electric Sales Corporation
- J. H. Bunnell and Company
- Graybar Electric Company
- Kellogg Switchboard and Supply Company
- Leich Sales Corporation
- Lindsay Telephone Supply Company
- North Electric Mfg. Co.
- Stromberg-Carlson Company
- Suttle Equipment Company

"Our 50th YEAR"

CHURCHILL CABINET COMPANY

CHICAGO 47, ILLINOIS

STROMBERG | CARLSON

transmitter

Published by the famous makers of XY Equipment

VOL. 2, NO. 11 FEBRUARY, 1954

Subscriber Line Resistance Limits - Part I

By W. Alfred Codd, Apparatus Engineering

This subject, because of its scope and general interest, has been divided into two parts. The second section will appear in the Transmitter for March, 1954.

IN the layout of a central office plant, one of the important problems that must be considered is the type and length of lines which may be used for connection of the subscribers to the central office. This depends upon the performance characteristics of the central office equipment and the telephone instruments furnished at the subscriber's premises. The performance characteristics are generally grouped under two heads, signalling and transmission. Signalling includes supervision functions, ringing and (in dial offices) dialing; while the term transmission is reserved to denote the transfer of voice signals over the circuit.

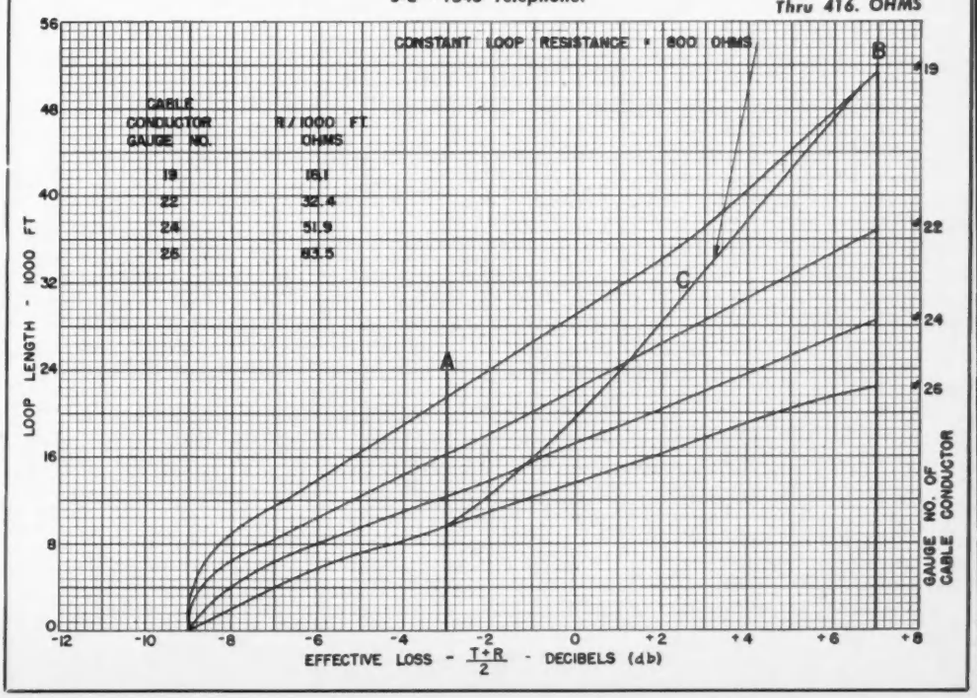
In expressing the limits of subscriber line length over which satisfactory performance may be obtained, it is desirable to use some characteristic of the line which will have the same limiting value for a given central office and given type of subscriber telephone for any type of line facility.

In the case of signalling performance it has been found that expression of line length in terms of its resistance meets this criterion very well. This follows logically from the fact that the various signalling functions are all performed by direct currents or currents of relatively low frequency. It is, therefore, common practice to express limiting lengths of subscriber lines for signalling in terms of their loop resistance. The design objective, of course, is that this resistance limit should have the same value in a given system for each of the several signalling functions. Where this is not true, the lowest of these values will become the signalling limit for the system.

A line limit in terms of a single value of limiting resistance for a given system is very readily interpreted in terms of the actual physical length for any type of line facility. It would be highly desirable if this same, or some other equally simple, characteristic could be used to express also a single limiting value for transmission performance. In this case, the ideal design objective would be to make this single limiting value coincide with that for signalling. Unfortunately, the situation is not so simple.

There are many contributing and inter-related factors determining over-all transmission performance. such as transmitter efficiency, receiver efficiency, side-tone balance, type and length of local and trunk lines,

FIG. 1
EFFECTIVE TRANSMISSION LOSSES FOR COMMON-BATTERY SUBSCRIBER LOOPS. AVERAGE OF TRANSMITTING AND RECEIVING.
S-C #1543 Telephone.
48 v. Battery
Thru 416. OHMS



battery supply circuit and others. It has been found possible to take account of these various factors by expressing transmission performance on a scale which basically uses as a unit a measure of the amount by which the power of the voice signal is decreased in passing through a unit length of a reference line or trunk. The zero point for such a scale is established by a reference transmission system. A given transmission system is checked against this reference system by comparing the intelligibility of conversations carried on each system. Any difference in intelligibility between the systems is rated in units of power loss which must be added to or subtracted from the reference line in order to produce the same change in intelligibility. Any part or parts of the transmission system can be varied — transmitting set, receiving set, subscriber's line or trunk — and show up as a changed system when compared against the reference. This rating of transmission performance is referred to as an effective transmission loss which may be either positive or negative and the unit in which it is expressed is the decibel (db).

By treating transmission performance in this manner a means is obtained for stating a single limiting value of transmission loss which should not be exceeded for any subscriber's connection in a given central office area. There are many inter-related factors entering into the rating for the local office. It has been found most practical to give these ratings in terms of values applicable to a given combination of telephone instrument, central office and subscriber line, and for a given direction of transmission. In general the rating is different when receiving than when transmitting. In applying these values it is common practice to use the average of the transmitting and receiving values or $\frac{T+R}{2}$ values. A limit on this $\frac{T+R}{2}$ value is then the means of expressing the limiting transmission performance for a given central office area. For any central office connecting with Bell Company toll lines, the Bell Companies assign transmission loss values which will assure intelligible connections between any two subscribers in the country. Typical values lie between +7.0 db and -6.0 db. These $\frac{T+R}{2}$ values or (T and R values separately) are generally presented in terms of tables or curves showing the effective losses for a given type of telephone set and central office and given type of line facility as a function of the length of the line expressed either in miles or thousands of feet. A curve sheet (Fig. 1) is shown giving representative data of this type. End Part I.

Part II of this article, to appear in next month's Transmitter, will discuss transmission limits for the subscriber's line in relation to signalling limits.

New Assignments for Sales Personnel

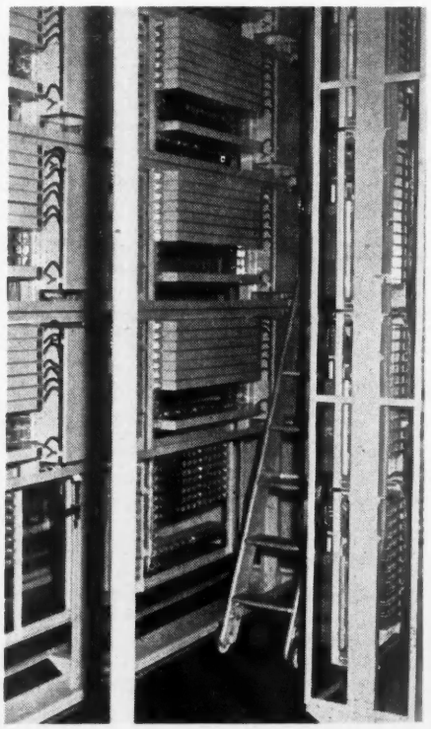
Just in case some readers have missed the announcements in the trade journals, the following changes in assignment have recently been made by T. C. Thompson, Sales Manager.

Coit V. Henley has taken over the New York and New England territory formerly served by the late F. C. Crawford. *Ernest D. Larson* has assumed Mr. Henley's former territory — Eastern Washington and Oregon, Idaho, Montana and Utah. *Sidney Crook* moves from Rochester to Chicago, continuing his work in sales engineering in that branch office.

All are looking forward to meeting new friends as they assume their new responsibilities.

Dial Zero Hour at Couer d'Alene

From top: Mr. M. Ebby, Mountain States Power Co., Earl David, Director; Mrs. Burl Hagadone; Mrs. W. R. Jarmon; T. C. Thompson, Stromberg-Carlson; J. P. Galligan, Stromberg-Carlson; W. R. Jarmon, President, General Telephone Company of the Northwest; Mrs. Stanley Easton; Roy Worley, Vice President, General Telephone Company of the Northwest; George Amas, Couer d'Alene District Manager.



4200 terminals of XY equipment now in service at Couer d'Alene, Idaho.

STROMBERG-CARLSON transmitter

General Telephone Company of the Northwest Establishes Major XY System Dial Center at Couer d'Alene

Midnight, and all was well, as XY Switches took over the job of extending calls to over 4,000 subscribers in the Couer d'Alene, Idaho telephone exchange. In addition, customer toll dialing was inaugurated throughout an extensive service area surrounding Couer d'Alene and to metropolitan Spokane offices, the first city in the West to have such a distinction, according to Mr. W. R. Jarmon, President of the General Telephone Company of the Northwest.

The best-read book in Couer d'Alene is the new telephone directory, since every number is changed in order to conform to the nationwide scheme of five digits. Those whose memory for often-called numbers had served them well are doing some serious "homework." An interesting slant comes from the automotive license bureau, where the desire to have registration plates corresponding to telephone numbers has caused a flood of inquiries since the new numbering scheme has been in effect.

Couer d'Alene has an importance in the economy of the Northwest which is not immediately apparent in population figures. Situated within easy commuting distance of Spokane, on a mountain-fringed lake of incomparable beauty, the city is becoming increasingly popular for suburban living. This, to the telephone company, means many more short-haul toll calls. Couer d'Alene also is the center for the mining and lumber industries of northern Idaho centered around Wallace, Kellogg, Pend Oreille Lake, Sands Point and Bonners Ferry. These industries depend for their very existence upon speedy, accurate communications, both local and distant; yet the requirements for service are subject to seasonal and other changes, resulting in a traffic pattern which is far from uniform. The type of equipment was chosen with this in mind.

The 4,200 terminals of XY dial equipment represent a new high for a *single* XY office in the Pacific Northwest. Added to the many thousands of lines already in service in other exchanges throughout the region, it is a clear indication of the dynamic upsurge of the area.

People who have made such material progress and who see no limit to the horizon, demand — and are getting — the best in modern dial telephone service. The General Telephone Company of the Northwest and its leaders — particularly Mr. Jarmon and Roy Worley, President and Vice President — can point with pride to the progress already made; their eyes, however, are on the future. What has happened in Couer d'Alene is but one long step in a carefully planned program of development.

Sharing thrill of successful cut-over of Couer d'Alene office: (l. to r.) J. S. Richards, Director; R. J. Whitekettle, General Commercial Manager; T. C. Thompson, Stromberg-Carlson; L. L. Gardner, Mayor of Couer d'Alene; W. R. Jarmon, President, General Tel. Co. of the Northwest; Burl Hagadone, Couer d'Alene Press.

Doorway to a promising future.

Couer d'Alene is a major operator toll dialing center.

STROMBERG-CARLSON transmitter

Postman's Holiday

No. 5 Seattle to Yellowstone National Park

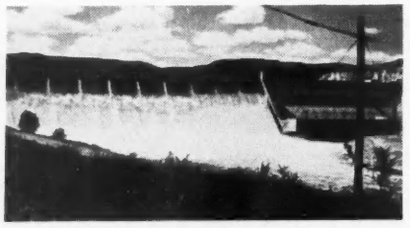
By George B. Forbes, Technical Publications Editor

To spend only one day at the *West Coast Telephone Co.* general office was a tease — but this was true everywhere. New friends and gorgeous scenery lay ahead as we climbed over the Cascades via Snoqualmie Pass and the more striking Blewett Pass. At the summit we gave the car a breather while the young lad "threw a stone a mile," and I tried to picture a line crew at work in a January blizzard.

The Couer d'Alene business office. Standing (right) is District Manager George Amas.

Grand Coulee Dam, catalyst of the new economy in Washington State, seemed more impressive than Hoover Dam because water goes over the top (I wish I could show you my color slides!). A small fraction of the power generated is used to pump water *uphill* into the former bed of the Columbia River, whence it flows by gravity to irrigate thousands of thirsty acres to the south. This present day miracle of cheap power and making the desert bloom is fraught with possibilities that telephone people are among the first to realize.

Well within the radius benefitted by Grand Coulee Dam is *Spokane*, heart of the Eastern Empire and home of the *General Telephone Co.*



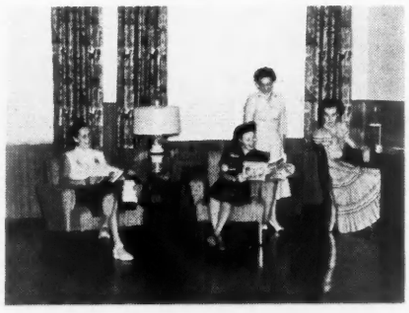
Grand Coulee Dam

of the Northwest. A genuine western-style welcome from *Roy Worley;* it was easy to see that he draws immense satisfaction from the progress this company has made. In 1937 there were two dial offices — Moscow and Orofino; now 50 of the 66 are dial, including the new XY Exchange at Couer d'Alene. He mentioned, in particular, the Kennewick District (they don't have to read about the atomic age — they're *in it*) and the Wenatchee District (53 PBX installations in this small city alone, to put fresh apples on your table) as examples of the spiraling demand for telephone service.

While Farragut Naval Training Station was a-building on Pend Oreille Lake, the contractor multipled together three small Stromberg-Carlson PBX switchboards during construction. Later common battery switchboards rented from *Wade Dean* of the Oregon-Washington Telephone Company, and adapted to give service over existing magneto lines, carried many thousands of dollars in toll from this active base.

A short chat with *Walter Boro* and *Bob Wallace*, then off with *Coit Henley* to see his particular pride — the Couer d'Alene office. *Chester Coover*, supervisor of central office equipment and *George Amas*, district manager, made no attempt to conceal their delight in the beautiful new office and equipment. The ladies even consented to a picture in their "reserved" area!

The evening was spent with *J. W. "Dick" Baker*, Secretary-Treasurer of both the Washington Association and the Rocky Mountain Association. Few can talk with greater authority of the evolution of this region and the chapters written by telephone people, great and small. Logging, when strong men denuded mountains on a diet of raw meat and whiskey;



Ladies' lounge — Couer d'Alene

mining, still the major industry around Wallace and Kellogg; transportation by water or horse before the Milwaukee and Northern Pacific had "tunneled" through. Every mile of the trip next day was the more interesting because of this chat with Dick Baker.

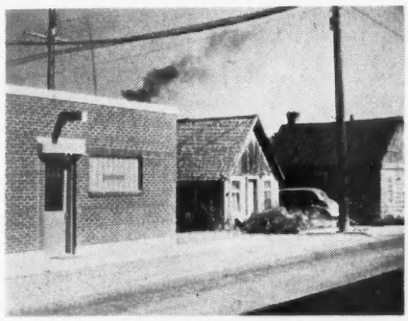
Tommy Thompson had told us to "look to our gas supply" on the Idaho-Montana border. Even with this good warning, we several times found ourselves scanning the horizon for signs of a town (and gasoline). Our

Montana means "mountains"

New Snake River Dam

Grand Tetons — beauty perpetuated

STROMBERG-CARLSON transmitter



Contrast in Salmon, Idaho.

tents, food and water stowed in the station wagon made it easier to enjoy the wild beauty which crowds upon you with overpowering embrace. Twenty-six miles of gravel at night down a steep winding grade cut through a ceiling of cedars — tents somehow lost their appeal; at the first motel we asked for bunks first and price later. One of our "neighbors" caught a 20 pound salmon that night.

The Northern Pacific, seeking a water grade route west, originally planned the main line through Salmon, Idaho, and started the telephone company there. *L. B. McGivney,* who operates the company for them, lets his XY equipment do the work while he atends to his managerial duties.

The next four days were definitely vacation. If we had to select the one spot we would most like to revisit, it would be the Grand Tetons. Here Man has wisely refrained from trying to improve upon Nature; the 7,000-foot vertical front lifts eyes and thoughts upward in a wild challenge that renders insignificant the problems of everyday life, and brings peace to the soul.

Yellowstone had its own wonders, including an unintentional breakfast with a bear while camping at the canyon. Our time, however, was running out; "vacation" over, we laid a course for Minnesota where we'll see you again next month.

Yellowstone Park boasts many geysers, bears and people.

The Credit Department Stresses Service and Financial Counselling

Successful telephone managers understand and practice the basic principles of sound credit management — otherwise they would not be successful. Stromberg-Carlson took the leadership, several years ago, in a new positive approach to credit policy: that of advising the owner how to plan for a major investment and then counsel as to the best means of financing. Essentially it is the same process used by the manager with his subscribers so that a benefit rather than a burden will be the end result.

The pyramiding demands for extended and improved service have created problems for the equipment manufacturers as well as the operating companies. The telephone business is geared for the long haul; payments are normally spread over a period of time with consequent danger of depletion in working capital. When open book accounts become unwieldy, Stromberg-Carlson assists the telephone company in finding other means of financing at favorable rates. Many examples of this assistance are on record; naturally all such transactions are confidential and must remain so.

Under the leadership of Charles Pritchard, now Stromberg-Carlson Treasurer; Arthur Fink, General Credit Manager; and Lester Wilterdink, Assistant Credit Manager, department personnel have tried to become personally acquainted with all customers. The consolidation of the credit function now in Rochester has actually fostered this plan in that each customer now has available *all* the resources of a centralized credit service. When policy decisions are called for, these can be made immediately. More companies can thus be served in a shorter period of time.

An important item in making credit transactions more personal is the increased use of the telephone. If you are in the Chicago or Kansas City territories, you will be talking with Henry Wise; if in the Rochester, San Francisco or Atlanta territories, Robert Slayton will contact you. They want to know you as people first, customers secondarily. Perhaps you, also, wish to know them better.

Henry Wise

Robert Slayton

Henry Wise came to Stromberg-Carlson in 1945 after service with the Navy in both war theaters. His working knowledge of radio and radar were put to use first in the Inspection Department. With the return to civilian economy, "Hank" chose to follow his college specialization — business administration, and has been in the Credit Department since 1947. Most of the managers in the great Midwest and Southwest regions know Hank through several years of pleasant association. For a period of a year or so he worked in the Chicago office, to establish closer contact with the people he now serves. Next to his wife, daughter, and home in Spencerport, N. Y., Hank chooses a trusty shooting iron in the fall hunting season or the Isaac Walton pastime of chasing "rainbows."

Robert Slayton came recently to the Credit Department where he will serve customers in the East, Southeast and West Coast areas. "Bob's" training began at Michigan State, followed by duty with the Air Force. Business administration was resumed at Cornell and the University of Rochester. His first job was with the Rochester Telephone Corporation; since coming to Stromberg-Carlson in 1948, he has worked in Telephone Sales and National Sales Engineering.

Bob and Mrs. Slayton have recently bought a new home, necessary furnishings to be selected at some future date.

Many will remember a photo of Bob Slayton with a sample catch of muskies at Lake Timagimi, Canada, that appeared in the September, 1953 Transmitter.

STROMBERG-CARLSON transmitter

New XY Exchange Brings Dial Service to Leesport, Pa.

The 1100 subscribers of the Leesport Rural Telephone Company have made a good bargain, for which they thank Mr. David Willits, Manager, and the board of directors. They now have the most modern dial service — XY — and free service to Reading and Laureldale; for all this they simply pay an increase which makes their present rates equivalent to those already in effect with the Bell Company for its Reading subscribers.

Telephone building at Leesport. 5-Truck garage is in rear.

Mr. Calvin Blatt, Burgess of West Leesport, makes first direct Leesport-to-Reading call on new XY equipment, as telephone company's Secretary-Treasurer Allen Willits (left) and President David Willits look on.

Mr. Willits has been working manager of this company, founded by his father, since 1939. During this period he has seen Leesport change from a rural community to a primarily suburban town. The city of Reading, eight miles away, is the business center, so that all plans for conversion of the Leesport exchange were based upon a close tie-in with the Reading offices.

Diversified agriculture, three large knitting mills, and other industries fanning out from crowded Philadelphia assure a healthy economy for this area. In Leesport alone, 300 new homes in the last two years indicate that Mr. Willits and his board of directors have chosen wisely in selecting XY equipment to provide dial service that anticipates the future.

The Stromberg-Carlson Credit Corporation assisted Mr. Willits in formulating plans and financing for his dial program.

Two Texas Towns Improve Service with New Manual Switchboards

Mrs. Bearden Sr., President of the Home Telephone and Electric Co. of Baird, Texas, remembers the days when Baird had five saloons and three churches, when range wars were prevalent, and a trial over a killing when it took 26 Texas Rangers to keep the peace.

Yes, the Beardens have seen Baird grow from a wild cow-town into a peaceful community. They have seen progress in many stages, especially in the field of communications in which they first invested in 1908, and later in 1916 when they first took control of the Home Telephone and Electric Co.

Under their direction, the Home Telephone and Electric Co. grew so large that it had to have a newer and larger switchboard. This requirement has been met with a Stromberg-Carlson manual switchboard. It was put into operation last December.

Today, Mrs. Bearden Sr., with a wonderful memory of the past, and her son, Fabian, General Manager of the Home Telephone and Electric Co., are looking toward the future when Baird, the county seat of Callahan County will be equipped with all the latest equipment that the telephone industry can offer.

* * * * *

Gulf States Telephone Co., headquarters at Tyler, Texas, has recently installed a Stromberg-Carlson universal switchboard that has 9 positions, 1200 lines and an ultimate of 1600 lines at Gatesville, Texas.

Mr. Oscar Burton and Mr. Morris Burton, Vice Presidents of Gulf States Telephone Co., and Mr. Rolla Johnson, General Manager, and local Managers William Bamburg and Truman Grisholm are pleased with this universal switchboard which has been built to be practical for toll purposes in the event of future conversion to dial.

Present, from the Tyler, Texas general office, at the cutover ceremonies last November, were Mr. D. Lamb, Assistant to the General Manager, Mr. L. A. Wallace, Equipment Engineer; Mr. H. Jones, Traffic Manager; Mr. B. Fox, Personnel Director; and Messrs. B. Cox and R. Thompson, from the Installation and Maintenance Department.

INDEX OF ADVERTISING

Acorn Insulated Wire Co. 104
Albert, J. E. 106
Alphaduct Wire & Cable Co. 109
American Electrical Heater Co. ..... —
American Steel & Wire Co. 33
American Tel. & Tel. Co. 68-69
Ansonia Wire & Cable Co. 25
Armstrong Cork Co. 98
Automatic Electric Sales Corp. 16, 40, 64, 65, 84, 86

Bartlett Mfg. Co. ..... —
Bashlin Co., W. M. 112
Berry & Co., L. M. 2
Bishop Manufacturing Corp. 93
Brushmaster Saw, Inc. ..... —
Buckeye Telephone & Supply Co. 38, 113

C & D Batteries 105
Cable Spinning Equipment Co. 100
Calculagraph Co., Inc. 18
Chance Co., A. B. 101
Chapman Chemical Co. ..... —
Chase Brass & Copper Co. ..... —
Churchill Cabinet Co. 114
Clayton & Lambert Mfg. Co. ..... —
Cleveland Trencher Co. ..... —
Coffing Hoist Co. ..... —
Commercial Cord & Supply Co. 94
Communi-Catering 106
Cook Electric Company ..... —
Copperweld Steel Co. 21
Crane Co., Inc. 106
Cullom & Ghertner 106

Daubendiek, C. H. 106
Davis Construction Co. 106
Diamond Wire Co. ..... —
Donnelley & Sons, R. R. 38
Du Pont de Nemours Co., E. I. ..... —

Electric Products Co., The ..... —
Electric Storage Battery Co. 5
Ericsson Telephone Sales Corp. ..... —

General Cable Corp. 28
General Electric Co. ..... —
General Insulated Wire Works, Inc. ..... —
General Telephone Directory Co. 124
Gladwin Plastics Co. ..... —
Gould National Batteries, Inc. 49
Graybar Electric Co. 91
Greenlee Tool Co. 94

Harris-McBurney Co. 106
Harrison Construction Co. ..... —
Henkels & McCoy 106
Highway Trailer Co. ..... —
Hill, Cyrus G. 106
Homelite Corp. ..... —
Hubbard & Co. ..... —

Independent Telephone Repair Co. 113
Indiana Steel & Wire Co. 75
Inet, Inc. ..... —
International Standard Elec. ..... —
International Harvester Co. 17
Insto-Gas Corp. ..... —

Jaeger Machine Corp. ..... —

Kamo Tools, Inc. ..... —
Kato Engineering Co. ..... —
Kearney Corp., Jas. R. 104
Kellogg Switchboard & Supply Co. 8, 9 10, 11, 12, 14, 15, 96, 97, 102, 103
Kaufman, H. J. 113
King, W. T. 106
Klein & Sons, Mathias 57
Koiled Kords 107
Koppers Company 87

Leece-Neville Co. 19
Leich Sales Corp. 60-61
Lenz Electric Co. ..... —
Line Equipment Co. ..... —
Line Material Co. — A. McGraw Electric Co. Div. 42
Loomis Advertising Co. 23
Lorain Products Corp. 123
Lowell Ins. Wire Co. ..... —

MacGillis & Gibbs Co., The 106
Mahood, Edwin T. 106
McCabe-Powers Auto Body Co. 39
McElroy Mfg. Corp. 4
Meyer-Opticraft, Inc. ..... —
Mitchell, Jay G. 106
Murer & Smith 106
Moss, T. J., Tie Co. ..... —
Mutual Liquid Gas Equip. Co. ..... —

National Carbon Co. ..... —
Natco Corp. 121
National Telephone Supply Co. ..... —
Neale Construction Co. 121
Neale, D. J. 106
North Electric Mfg. Co. 6, 7

Onan & Sons, Inc. ..... —
Overton Co., S. E. ..... —

Page & Hill, Inc. 108
Paragon Electric Co. ..... —
Penn Line Service 106
Petersen Engineering ..... —
Philco Corp. ..... —
Porcelain Products, Inc. 108
Porter, H. K. ..... —
Power Equipment Co. 95
PreFormed Line Products ..... —
Premax Products, Inc. ..... —
Pyrofax Gas Co. ..... —

Ray-O-Vac Co. ..... —
Raytheon Manufacturing Co. 85
Reliable Electric Co. 46
Remington Rand, Inc. ..... —
Republic Creosoting Co. ..... —
Ripley Co. ..... —
Roll-A-Reel ..... —
R. T. & E. Co. ..... —
Runzel Cord & Wire Co. 107

S. & G. Manufacturing Corp. ..... —
Schauer Mfg. Co. ..... —
Sentinel Company, The ..... —
Seymour Smith & Son, Inc. 82
Sherron Metallic Corp. ..... —
Sloan, Cook & Lowe 106
Stahl Metal Products ..... —
Stewart Bros., Div. of Instrument Labs. ..... —
Stromberg-Carlson Co. 44, 45, 80, 81, 88, 89, 115-120
Sturgis Posture Chair Co. ..... —
Suttle Equipment 106, 114

Taylor-Colquitt Co. 38
Tel-E-Lect Products, Inc. 98
Telephone Advertising Inst. ..... —
Telephone Answering & Recording Corp. 34
Telfon Fabrik Tutomatic A/S 40
Telephone Engineer Publishing Corp. 22
Telephone & Power Supply Co. ..... —
Telephone Repair & Supply Co. 113
Tele-Systems, Inc. 36
Tele-Wire Supply Co., Inc. ..... —
Telkor, Inc. 113
Termite Drills ..... —
Texas Creosoting Co. ..... —
Thompson Chemicals Corp. 35

U. S. Independent Tel. Assoc. ..... —
U. S. Instrument Co. 40
U. S. Motors ..... —
U. S. Steel Corp. American Steel & Wire Div. 33
U. S. Steel, Coal & Chem. Div. 37
Utica Drop Forge & Tool Corp. ..... —

Vannort, B. O. 106
Vulcan Electric Co. ..... —

Wall Mfg. Co. ..... —
Western Electric Co. 26, 27
Wiebel, L. H. 113
Williams, Geo. E. 112
Williams Inspection Co. 106
Whitney Blake Co. 41
Wyoming Valley Equipment Co. ..... —

York-Hoover Corp. (Body Div.) ..... —

NATCO
CLAY CONDUIT

The proved and standard protection for Underground Telephone Cables. Highest quality and full line of shapes.

NATCO CORPORATION
formerly National Fireproofing Corp.
327 Fifth Avenue, Pittsburgh 22, Pa.

CAN DO
Any Kind of Outside Plant Job

Whether it's new construction, regular maintenance, or emergency repair, call Neale and get a crew of high skilled men who work with the most modern equipment. Your outside plant will operate more efficiently and last longer. Estimates made without obligation.

NEALE CONSTRUCTION CO.
ENGINEERING • CONSTRUCTION • MAINTENANCE
TOPEKA, KANSAS PHONE 4-2621

THE BACK OF THE BOOK

BY JOHN G. REYNOLDS

West Coast's "Tame Statistician"

THE EDITOR of "Crosstalk," company magazine of the *West Coast Telephone Co., Everett, Wash.*, reports that news of the 50,000,000th telephone installation strangely affected their "Tame Statistician." Crosstalk editor said — he dived for his slide rule and made moaning noises. Several minutes and fifteen sheets of paper later he burbled: "Fifty million telephones! D'ja realize what that means in work? Our average installer installs four telephones in an 8-hour day and works 260 days in a year.

"So if John Doakes, installer, started out to install 50,000,000 telephones today, he would take 48,076 years and he could retire on his pension in the fall of 50,029 A.D."

"Yes, but suppose he didn't last that long?" the editor asked.

"And," continued the Tame Statistician, "that ain't the half of it. Actually we have to install 486 'phones to make a net gain of 100. People come and go, you know. So John Doakes would have to make 243,000,000 installations to get that 50,000,000th 'phone on the wall."

"Wasn't on a wall," the editor objected, "it was on the President's desk."

"That makes it tougher," he replied. "He'd probably take more than two hours on that one. Anyway, installing 243,000,000 'phones would take him 233,654 years. He could then go fishing in 235,607 A.D. supposing that the government of that day will let anyone fish."

"What about the 193,000,000 disconnects?" the editor inquired. "Is Doakes gonna handle those in his spare time?"

But the Tame Statistician had fled!

New Hollywood Fad

ONE OF Hollywood's latest fads — a cross between a superparty line and a telephonic pickup service — has worried telephone officials looking for a way to stop it.

The game is called "operation crosswire" by its devotees, and the "busy stuff" by Pacific Telephone & Telegraph Co. agents who have been plagued sporadically by it for several years.

The rules are simple and any number can play. All that's needed is to dial certain test numbers which always result in a busy signal. "Players" find they can converse and exchange telephone numbers with others connected to the same busy signal.

But the conversations must be timed to take place between the "beeps" of the signal.

Although participants in this "telephonic lonely hearts club" think it's great fun, PT&T personnel say the situation can be "mighty serious." The calls quite frequently tie up blocks of circuits, and can prevent persons not in the game from using their telephones for outgoing or incoming calls.

At present, telephones in one area calling busy numbers all hear the same recorded busy signal, a spokesman said, and the only way to halt the game completely would be to give each caller his own busy signal.

Present procedure for getting a blind date at the courtesy of the telephone company is to shout "hello" between the beeps until a voice of the opposite sex replies. Then the caller yells his number, giving each digit between beeps.

Both parties hang up and the interested person calls the number for a chat which may lead to a date.

At least one Hollywood wolf boasts that since he learned of operation crosswire, "getting dates has been no problem."

PT&T agents, sheriff's deputies and police said the game was started by high school students several years ago and "later got into bad hands."

"300 *Per Minute*"

THEY ARE chuckling in Glasgow, Scotland over the "$50 phone call" to New York which Al Martino, young American singer, ran up during his recent engagement at the Empire Theater in the Scottish City.

"What d'you know?" he was asking his friends in a leading Glasgow hotel after finishing the call.

"Here I am phoning my wife in New York and in the middle of it she decides the baby's crying and she's got to see to him.

'Hold on' she says — at about $3 a minute." Five minutes or more went by before Martino's wife returned to the telephone to say the baby was all right.

we've SCREENED

YOUR POWER PROBLEMS

. . . and for Battery Charging

FLOTROL

is the SOLUTION!

Once installed, FLOTROL requires no further attention, because it contains no moving parts, and it automatically supplies the load current as needed. These and other outstanding features assure you of greater power savings, reduced maintenance costs, and longer battery life.

Send For Bulletins 160 & 161

1122 F Street **LORAIN** Lorain, Ohio

PRODUCTS CORPORATION

Designers and Manufacturers of Telephone Power Equipment

FLOTROL

PARTNERS IN DEPENDABILITY

SUB-CYCLE

You've probably read and heard lots of business prophecies for this year—"new signs of optimism," "keep an even keel" and "start of a downward trend." Both professional and amateur forecasters have had their say.

The only prediction we wish to make is this:

Whether you believe the outlook for 1954 is good or bad, you'll be in a much better position, relatively—if you employ our Complete Directory Service Plan now.

Independent telephone companies which have employed our service during the past twenty years are always confident that every issue will be a successful one. They know from experience that General Telephone Directory Company has the ability to produce more attractive, more accurate, and more profitable directories! We'd like to tell you more about our service.

Why don't you write or call our nearest office today so that we may arrange to meet with you at your convenience?

GENERAL TELEPHONE DIRECTORY COMPANY

GENERAL TELEPHONE SYSTEM — TELEPHONE

Our Complete Directory Service Plan includes all phases of directory publishing: sale of advertising, compilation, proofreading, paging, printing and preparation of directories for delivery.

Nation-wide Publishers of Telephone Directories

Des Plaines, Illinois
1800 Busse Highway
VAnderbilt 4-2164

Long Beach, Calif.
604 Pine Avenue
Telephone 6-7221

San Angelo, Tex.
3 South Taylor St.
Telephone 6738

Spokane, Wash.
N. 108 Washington
MAdison 8644